DOCUMENT RESUME

ED 251 082 IR 050 904

TITLE	User Statistics and Studies. SPEC Kit 25.
INSTITUTION	Association of Research Libraries, Washington, D.C. Office of Management Studies.
PUB DATE	Mar 76
NOTE	164p.
PUB TYPE	Collected Works - General (020) -- Reports - Research/Technical (143)
EDRS PRICE	MF01/PC07 Plus Postage.
DESCRIPTORS	*Academic Libraries; Higher Education; Information Needs; Library Services; Library Surveys; *Research Libraries; *Self Evaluation (Groups); *Statistical Surveys; User Satisfaction (Information); *Use Studies

ABSTRACT

A result of the Association of Research Libraries' (ARL) November 1975 Services Survey, this kit presents statistical studies developed from management information sources such as circulation records or generated expressly for a particular study. While academic and research libraries maintain statistical records measuring library efficiency or costs, concern has increased for determining library output or effectiveness, i.e., how well the library actually meets the users' needs. This concern relates to the library's ability to serve, with limited budgets, groups widely diversified in terms of information needs, academic level, and patterns of library use. The need to justify activities to the parent institution, to evaluate possible new services, to predict and influence change, as well as increased computer capabilities which facilitate the handling and manipulation of large quantities of data, and the establishment and funding of research offices in some libraries, have also encouraged the use and development of statistical data. Almost all libraries responding to the survey engage in some form of statistical data collection (whether it be continuous or formal research projects) reflecting the level and type of use of the libraries' service operations. This kit contains 17 documents from ARL libraries on continuing data collection and formal statistical studies. (THC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

spec

March 1976

Systems and Procedures Exchange Center

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☒ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

ED251082

User Statistics and Studies

Kit 25

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Maxine Sitts
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

IR050904

The Systems and Procedures Exchange Center (SPEC) is operated by the Association of Research Libraries, Office of Management Studies,
1527 New Hampshire Avenue, N.W., Washington, D.C. 20036. Telephone (202) 232-8656.

OMS
OFFICE OF MANAGEMENT STUDIES
ASSOCIATION OF RESEARCH LIBRARIES
1527 New Hampshire Avenue, N.W., Washington, D.C. 20036 • (202) 232-8656

Duane E. Webster, Director/OMS
Jeffrey J. Gardner, Associate
Deanna B. Marcum, Training Program Specialist
P. Grady Morein, Associate
Maxine K. Sitts, Information Services Specialist

SPEC KIT EVALUATION

The materials in this Kit were collected from a survey of the member libraries of the Association of Research Libraries. They were selected for inclusion here because they are among the best examples received of current management practices in academic and research libraries.

These documents are working tools developed by individual libraries to meet their specific purposes. The materials are not intended to provide models or prototype systems that can simply be copied by other libraries. Instead, these illustrations should stimulate further innovation and improvement in the management practices of academic and research libraries.

We will appreciate your evaluation of this Kit.

* * *

Subject of Kit ____

How useful did you find this SPEC Flyer and Kit?

Very much ______
Quite a bit ______
Somewhat ______
Not at all ______

How did you use these materials?

What topics would you like to see covered in the future?

Date ______________________________

Your Name ______________________________

Institution ______________________________

Address ______________________________

____

ZIP ____________

(Fold, staple, stamp, and mail)

- -

STAMP
PLEASE

TO
Association of Research Libraries
Systems and Procedures Exchange Center
1527 New Hampshire Avenue, N.W.
Washington, D. C. 20036

spec flyer
March, 1976 No. 25
OMS
Systems and Procedures Exchange Center
ISSN 0160-3574

USER STATISTICS AND STUDIES

Academic and research libraries have traditionally employed user statistics to quantitatively describe the library's activities. As indicators of trends in library use and forecasters of future events, statistical data are of value in the decision-making, planning and evaluation areas. However, as operations expand, economic pressures intensify, and options multiply, administrators are looking to benefit further from statistical data. A previous SPEC Flyer, No. 23, discussed user surveys: this Flyer, a result of SPEC's November, 1975 Services Survey, examines statistical studies which are developed from management information sources such as circulation records or which are generated expressly for a particular study.

While academic and research libraries maintain statistical records measuring library efficiency or costs, concern has increased for determining library output or effectiveness -- how well the library actually meets users' needs. This concern relates to the library's responsibility to serve, with limited budgets, groups widely diversified in terms of information needs, academic level, and patterns of library use. It has also been precipitated by the need to further justify activities to the parent institution, to evaluate possible new services, and to predict and influence change. Increased computer capabilities which facilitate the handling and manipulation of large quantities of data, and the establishment and funding of research offices in some libraries have also encouraged the use and development of statistical data.

According to the SPEC Services Survey, almost all responding libraries engage in some form of statistical data collection reflecting the level and type of use of the libraries' service operations. These range from continuing data collection, which is generally an integral part of operations, to formal research projects, limited in duration and scope.

Continuing Data Collection. Most libraries maintain tallies reflecting individual transactions between the library and patron. These are periodically tabulated or expressed in graph form and frequently appear in annual reports and libraries' working papers. Computations for the most part are restricted to simple calculations -- totals, percentages, and rankings. Statistics maintained by reference departments often give an indication of the type of questions and problems categories of users have in using the library, the time expended in aiding patrons, and patterns of heavy and light library usage. Such data have proven useful in designing library instruction programs, developing collections, designing and positioning directional signs, and rescheduling professional and paraprofessional reference staff. Depending upon the circulation system, loan records may indicate who is using the collection, when and how it is being used, and which types of materials are circulating to which types of users. Such information helps administrators plan service and acquisitions policies and frequently provides the basis for more in-depth research.

Formal Statistical Studies. Formal statistical studies are not usually part of regular operations, but are often generated in response to a specific problem, as part of the library's planning process or, occasionally, as pure research. They are generally characterized by more

The Systems and Procedures Exchange Center (SPEC) is operated by the
Association of Research Libraries, Office of University Library Management Studies,
1527 New Hampshire Avenue, N.W., Washington, D.C. 20036. Telephone (202) 232-8656.

complex processes of data collection and manipulation, and utilization of samples representing library users. They typically result in formal reports describing the research methodology, results, and recommendations for operational change or further research. These types of studies include materials availability studies, preference studies, and user satisfaction studies. Many studies focus on users' needs, attitudes and success in using the library.

Some libraries conduct availability studies to assist in developing interlibrary loan and duplicate book policies, and in moving toward cooperative acquisition programs. In some cases, the libraries test the availability of a random sampling of materials; in other cases, the results of actual searches for materials requested by patrons are used. In either case, statistics are frequently maintained as to materials' status (available, on loan, reserve, or missing), and time required to locate the materials. Documentation resulting from the SPEC Survey indicates that many libraries are capitalizing on computer-assisted circulation data. Machine readable circulation records facilitate complex correlations such as relationships between types of borrowers, and publication dates and classification. Data on issues such as use frequency of materials can also be gathered relatively simply with machine-based circulation systems. Such information has helped in the formulation of collection development, acquisition, renewal, and reserve book policies, the planning of new buildings, and planning for storing or consolidating collections.

Other methods have been used to quantitatively describe library-user relationships. Libraries have formally studied user approaches to the public catalog through structured observation and/or interviews with users. Headcounts and polls help determine use levels of facilities, and future space requirements. Another area of some interest appears to be in the development of statistical models. These are designed to represent like situations under different circumstances: a typical application has been to simulate the effects of alternative loan policies.

Future Needs and Trends. Expanded computer capabilities, further development of statistical models and formulas, the incorporation of statistical expertise, and the support of library research offices may enhance the use of statistics in libraries' future evaluation and planning processes. Presently, however, there are factors which inhibit greater use of statistics, including the cost of collecting and analyzing them and a degree of skepticism pertaining to their reliability and relevancy. Furthermore, research libraries' roles as national resources of distinctive collections make library performance difficult to measure merely by use. While SPEC survey results indicate an awareness of the importance of developing new tools and techniques for measuring library outputs, implicit in this awareness is a need to determine and deal with the limitations of quantitative studies and the continued need for qualitative judgments. Data collection and research methodologies reflecting a better understanding of various user segments, how and which services can be quantitatively and qualitatively described; the influence of variables; and tests for statistical reliability and validity need further development in order for statistical data to be used to their fullest potential.

The SPEC Kit on User Statistics and Studies (135 pages) contains 17 documents from ARL Libraries on continuing data collection and formal statistical studies. The Kit is available for $7.50 to ARL members and subscribers and for $15.00 to all others, prepayment required, from: Office of Mangement Studies, Association of Research Libraries, 1527 New Hampshire Avenue, N.W., Washington, D.C. 20036.

ISSN 0160 3582

USER STATISTICS AND STUDIES

KIT 25 - MARCH 1976

TABLE OF CONTENTS

	PAGE
Duke University, Use of the Collection	1
Washington University, Reference Question Statistics	2
Dartmouth College, Statistical Report	3
University of Washington, Circulation Statistics	5
University of Pittsburgh, Analysis of Statistics	7
Purdue University, Study of Statistics	16
Indiana University, Guide to Reference Tally Sheet	24
University of Colorado, Definition of Type of Question	27
Northwestern University, Policy Statement	29
University of California-Berkeley, An Informal Report	31
University of California-Berkeley, Document Availability and Use Patterns	47
Princeton University, Investigation of Availability of Books	63
Purdue University, Circulation of Materials	69
University of California-Los Angeles, Working Group on Public Catalogs	83
Yale University, User Requirements in Identifying Desired Works	100
Princeton University, Science and Technology Libraries Space Report	127
Case Western Reserve University, Computer Simulation	135

SELECTED PORTIONS OF
DUKE UNIVERSITY

THE UNIVERSITY LIBRARIES
DUKE UNIVERSITY

REPORT TO THE PROVOST
1973-74

Use of the Collection

Recorded use of the collection varies from year to year as influenced by methods of teaching, quality and affluence of students, the weather, and other reasons which on the surface may appear unlikely. However, the trend continues upward, and last year 2.2 percent more books were lent than in the previous year. The number of questions asked at the several reference desks was up 3.5 percent. Loans from the Perkins Library were up 6.1 percent, from the Divinity Library down 8.5 percent, from the East Campus Library down 1.9 percent, and from departmental libraries down 5.5 percent. Interlibrary loans increased 10.4 percent, with 9,939 books being lent to other libraries.

The number of researchers using the Manuscript Collection was 3.1 percent higher than in 1972-73, and reference activities in the department were correspondingly higher. The users included fifty-eight professors from forty-eight universities, seven of them foreign, and 123 graduate students from forty-three institutions.

The largest increase in number of users was in Rare Books, where forty-one percent more books were borrowed. During the year, 11,374 visitors came into the Rare Book Room, 3,773 more than in the previous year. The substantial use of the collection by undergraduates is interesting, and suggests that the demands of undergraduate instruction more and more send them to primary sources. Heavier use of the collection is, of course, associated with the number of titles available there--now more than 60,000--but also to the detailed indexing of each item for the record in that department. When a fully cataloged book comes to Rare Books, it is indexed according to printer, place and date of printing, binding, ownership, illustrations, illustrators and the like. These supplementary details represent an accumulation of data which illumines not only the history of the book but also the value of the collection. Mainly, however, they enable the researcher interested in bibliography to discover from checking the catalog many more titles likely to be of interest to him than formerly was possible. More adequate indexing of special materials such as maps, broadsides, Confederate Imprints, incunabula, Latin manuscripts, utopias and early English plays, likewise draw more users to the Rare Books Department.

For the first time, a count of users requesting assistance in consulting back files of newspapers and other materials on microtext was kept. This cannot be an accurate record, since heavily used newspapers, like The New York Times, are on open shelves in the Microtext Reading Room, and may be consulted without the assistance of the staff. Moreover, a large number of newspapers are preserved in hard copy and many users still prefer to consult them in the stacks rather than in microtext form. The statistics revealed that back files of periodicals and special resources such as the Short Title Catalog were consulted by 1,50 users, newspapers by 1,305 (New York Times was consulted by 314), and manuscripts and theses by 354. The principal reason for the tabulation was to determine the amount of use back files of foreign newspapers are receiving. While every foreign title was consulted, twenty-two files were consulted only once; four domestic titles, likewise, were consulted only once. These figures suggest that further study of the newspaper subscription list is needed.

FROM ANNUAL REPORT OF REFERENCE DEPT:
JOHN M. OLIN LIBRARY WASHINGTON UNIV. 1974-75

REFERENCE QUESTION STATISTICS

February 975

STATUS OF INQUIRER	LIBRARY USER							TOTAL	TELEPHONE							
	M	TU	W	TH	F	SAT	SUN		M	TU	W	TH	F	SAT	SUN	
. Faculty	1	2	6	7	3			19	5	4	13	7	12	2	1	
. Student	70	70	110	68	57	50	33	458	12	1	12	8	6	7		
. Staff	2		7	7	5	1		22	11	3	20	6	15			
. Non-Washington University	12	6	12	16	17	14	13	90	14	15	18	24	16	17	1	
TAL	85	78	135	98	82	65	46	589	42	23	63	45	49	26	2	
TYPE OF QUESTION																
. Directional	35	26	61	42	35	22	17	238	8	3	6	8	15	23		
. Ready Reference (less than 5 min.)	46	53	66	45	41	37	28	316	37	22	33	31	28	22	2	1
. Research (more than 5 min.)	5	4	10	8	8	1		36	1	1	4	5	6			
OTAL	86	83	137	95	84	60	45	590	46	26	43	44	49	45	2	2
SOURCE OF ANSWER																
. a) Reference Desk	13	14	22	12	10	12	15	98	5	9	13	5	8	10	1	
b) Reference	32	29	27	34	34	30	10	196	5	2	12	5	10	7		
. Bibliography	6	4	21	13	8	20	8	80		3	3	5	5			
. Documents	4	4	8	10	1	20		47		1		2	2			
. General	1	3	6	5	4			19			2					
5. Card Catalog	13	15	20	15	15	20	7	105	24	11	13	18	12	10	1	
. Other	17	16	30	24	20	22	7	136	11	3	7	14	15	10		
TOTAL	86	85	134	113	92	124	47	681	45	29	50	49	52	37	2	

00

WASHINGTON UNIVERSITY

THE DARTMOUTH COLLEGE LIBRARY STATISTICAL REPORT 1974-75

RECORDED CIRCULATION

	1973-74	1974-75			
	Total	Faculty	Students	Other	Total
ART LIBRARY (Sherman)					
General	10,469	2,832	6,486	2,020	11,338
Reserve	5,863				
BIOMEDICAL LIBRARY (Dana)					
General					
Printed Volumes	25,101	7,221	14,802	2,325	24,348
Audiovisual Circulation		113	1,099	294	1,506
Reserve	9,213		11,854		11,854
BUSINESS-ENGINEERING LIBRARY (Feldberg)					
General	15,889	2,834	7,682	463	10,979
Reserve	12,157		9,131		9,131
CENTRAL LIBRARY (Baker)					
Circulation Desk	121,638	18,576	89,295	14,211	122,082
Recordings	513		520		520
Reserve Desk	75,089		83,863		83,863
ENGLISH LIBRARY (Sanborn)					
General	2,091	203	1,673	89	1,965
Reserve	1,222		1,725		1,725
MATHEMATICS LIBRARY (Bradley)					
General	1,694	525	1,141	33	1,699
Reserve	244		240		240
PHYSICAL SCIENCE LIBRARY (Kresge)					
General	5,584	1,260	12,315	414	13,989
Reserve	2,013		7,460		7,460

SUMMARY

	1973-74 Total	Faculty	Students	Other	Total
GENERAL CIRCULATION	184,858	33,451	133,394	19,555	186,400
RESERVE CIRCULATION	105,801		114,273		114,273
MAPS	924		706		706
RECORDINGS	513		520		520
OTHER AUDIOVISUAL		113	1,099	294	1,506

INTERLIBRARY LOANS

		1973-74 Total Requests Filled	1974-75	Requests Filled				Requests Not Filled
			Titles	Printed Volumes	Microtext	Xeroxed	Misc. Materials	
LENT	(Baker)	3,125	3,109	1,695	195	1,215	4	1,301
	(Dana)	2,648	2,678	425	7	2,243	3	943
	(Feldberg)	160	286	130		156		97
	(Kresge)	104	327	128		199		48
BORROWED	(Baker)	1,009	1,189	751	31	407		778
	(Dana)	538	665	78		587		68
	(Feldberg)	254	396	31	1	364		223
	(Kresge)	51	166	45	4	117		89

004

DARTMOUTH COLLEGE LIBRARIES | Circulation statistics month of 19 | Library or Department: CIRCULATION

Date	GENERAL CIRCULATION					JOURNALS						Other - specify
	Students G	D' Guests GB	Faculty	Daily Totals	Weekly Totals	U	G	DC	GB	FAC	DAILY TOTALS	
12 Monthly Totals												

C/5
13

UNIVERSITY OF WASHINGTON

UNIVERSITY OF WASHINGTON LIBRARIES
Circulation Statistics
July 1975

	General Circulation	Reserve Circulation	In-Libr. Use Staff Assisted	In-Libr. Use - Pick-Up	TOTAL	This Year to Date	Last Year to Date	% Change
SUZZALLO								
Total Arch/MSS	--	--	1,137	--	1,137	1,137	1,005	+ 13.1
Archives	--	--	(111)	--	(111)	(111)	(735)	NA
Sched. Records	--	--	(862)	--	(862)	(862)	NA	NA
MSS	--	--	(164)	--	(164)	(164)	(210)	- 22.0
Circulation	15,136	--	--	9,543	24,679	24,679	29,246	- 15.6
Total Ref. Div.	1,721	1	4,472	10,365	16,559	16,559	22,673	- 27.0
Curric. Center	(539)	--	(215)	(8,116)	(8,870)	(8,870)	(12,330)	- 28.1
Docs. Center	(358)	(1)	(1,599)	(111)	(2,069)	(2,069)	(2,508)	- 17.5
HRAF	--	--	(827)	--	(827)	(827)	(155)	+ 43.4
Map Center	(819)	--	(568)	(264)	(1,651)	(1,651)	(868)	+ 90.2
Reference	(5)	--	(1,263)	(1,874)	(3,142)	(3,142)	(6,812)	- 53.9
News/Micro	--	--	4,977	1,817	6,794	6,794	5,657	+ 20.1
Science Read. Rm.	4,238	--	156	2,945	7,339	7,339	9,220	- 20.4
Serials Division	660	3,994	1,293	20,123	26,070	26,070	28,377	- 8.1
Total Spec. Coll.	--	--	9,491	68	9,559	9,559	4,723	+102.2
Northwest Coll.	--	--	(1,556)	(68)	(1,624)	(1,624)	(1,383)	+ 17.4
Photography	--	--	(7,143)	--	(7,143)	(7,143)	(2,173)	+228.7
Spec. Coll.	--	--	(792)	--	(792)	(792)	(1,172)	- 32.4
TOTAL SUZZALLO	21,755	3,995	21,526	44,861	92,137	92,137	100,906	- 8.7

Circulation Statistics
July 1975

	General Circulation	Reserve Circulation	In-Libr. Use--Staff Assisted	In-Libr. Use--Pick-Up	TOTAL	This Year to Date	Last Year to Date	% Change
Architecture	1,008	614	233	530	2,385	2,385	3,813	-37.5
Art	1,478	849	43	1,499	3,869	3,869	3,734	+ 3.6
Business Admin.	3,114	4,480	2,479	554	10,627	10,627	9,640	+10.2
Chemistry-Pharmacy	1,048	464	241	1,405	3,158	3,158	3,236	- 2.4
Drama	504	634	780	12	1,930	1,930	1,902	+ 1.5
Engineering	1,913	466	--	2,423	4,802	4,802	5,250	- 8.5
Far Eastern	2,093	51	515	2,802	5,461	5,461	4,588	+19.0
Fish/Oceanog.	1,679	262	83	1,266	3,290	3,290	2,520	+30.6
Forestry	652	19	20	497	1,188	1,188	1,229	- 3.3
Geography	573	362	149	391	1,475	1,475	1,328	+11.1
Health Sciences	7,146	2,698	--	26,958	36,802	36,802	31,229	+17.9
Math Res.	836	201	--	649	1,686	1,686	1,673	+ 0.8
Music	2,536	189	10	548	3,283	3,283	3,188	+ 3.0
Music Listening Ctr	467	208	924	89	1,688	1,688	1,717	- 1.7
Philosophy	514	20	141	127	802	802	881	- 9.0
Physics	664	156	--	534	1,354	1,354	1,009	+34.2
Poli.Sci.	1,154	525	168	313	2,160	2,160	2,113	+ 2.2
Social Work	428	93	14	99	634	634	723	-12.3
OUGL	11,145	11,108	--	19,527	41,780	41,780	35,382	+18.1
TOTAL (including Suzzallo)	60,707	27,394	27,326	105,084	220,511	220,511	216,061	+ [illegible].1
Media Center Dial-In Users					54,158	54,158	36,341	+49.0

ANALYSIS OF LENDING AND REFERENCE USE STATISTICS FOR WEEK OF MARCH 13-19, 1972

Circulation Statistics

1. The Reference Weekly Use Curve showed a high peak Monday (20.19%), a gradual dropping off through Saturday (9.07%) and a dramatic rise again on Sunday (16.30%). Friday and Saturday were the lowest use days.

The Lending Weekly Use Curve showed a high on Tuesday (18.84%) and the low point being Sunday (9.60%), quite different from Reference, though Saturday was the next to last busiest period in Lending, correlating in general with reference.

Reference	Lending
Monday	Tuesday
Tuesday	Wednesday
Sunday	Friday
Wednesday	Monday
Thursday	Thursday
Saturday	Saturday
Friday	Sunday

2. The Reference Hourly Use Curve for the week showed a high for 1:00 p.m. (11.39%) and next 12:00 noon (11.18%). Sunday use raised the statistics significantly for these hours. The afternoon hours until 5:00 p.m. are the next busiest periods in reference. After 10:00 p.m. is the least busy time of the day, even less so than the opening hour. The early evening hours, from 6:00 p.m. - 9:00 p.m. showed another busy period.

The Lending Hourly Use Curve shows the peak period from 4:00 p.m. - 5:00 p.m. and the next busiest periods earlier in the afternoon. From 12:00 noon to 6:00 p.m. were the busiest hours in lending and the least busiest was from 7:50 a.m. until 11:00 a.m. Lending use also dropped off after 10:00 p.m. though not to the degree reference did.

Reference	Lending
1:00 p.m.	4:00 p.m.
12:00 noon	3:00 p.m.
2:00 p.m.	2:00 p.m.
3:00 p.m.	1:00 p.m.
7:00 p.m.	5:00 p.m.
6:00 p.m. & 4:00 p.m.	12:00 noon
8:00 p.m.	8:00 p.m.
9:00 p.m.	9:00 p.m.
11:00 a.m.	7:00 p.m.
10:00 a.m.	11:00 a.m.
5:00 p.m.	10:00 p.m.
9:00 a.m.	6:00 p.m.
8:00 a.m.	11:00 p.m.
10:00 p.m.	10:00 a.m.
	9:00 a.m.
	8:00 a.m.
	7:00 a.m.

3. Of the total Reference use during this week, 23% were Non-Pitt users and 77% were Pitt students, faculty and staff. This means roughly 1 out of every four patrons serviced in reference was a Non-Pitt person. In the Non-Pitt user group, the largest percentage was high school students (20.35%) and the next highest users in this group were from universities and colleges outside the Pittsburgh area (17.06%). Duquesne University students and faculty came in third. Of the Non-Pitt users, Chatham students (.29%) were the lowest. The rankings run thus:

NON-PITT USERS (334)	PITT USERS (1132)
High School 20%	Undergraduate 59.8%
Colleges outside Pgh. 17%	Graduate 33.3%
Duquesne 16.7%	Faculty 3.4%
Community 15.8%	Staff 3.3%
Robert Morris 6.2%	
Carnegie-Mellon 5.9%	
Other 4.4%	
Community College 3.2%	
Point Park 2.9%	
Alumni 2.9%	
Industry 2.0%	
Carlow 1.4%	
Chatham .29%	

The lending statistics showed 341 Special Patron charges or 5.58% of the total circulation for the week. There were more Special Patron charges than faculty charges (58 more) and nearly twice the number of staff charges. Undergraduate charges represented the largest group of lending charges (3482), the next largest being graduate student charges (1296).

Circulation Analysis of Charges From March 13-19, 1972 By Type of Patron

TYPE OF PATRON	COUNT
Undergraduate Charge	3482
Staff Charge	199
Graduate Charge	1296
Special Patron Charge	341
Faculty Charge	283
Faculty Renewal	6
Graduate Renewal	266
R.B.R. Charge	47
Bindery Charge	22
Locker Charge	27
Faculty Study Charge	25
Internal Loan	5
Internalibrary Loan	28
Carrell Charge	76
Total	6103

4. Of the Special Patron circulation, 96 transactions were to Duquesne graduate students and faculty. This was 28% of the Special Patron circulation. The next highest group were alumni, 75 transactions or 21.9%. The third highest Special Patron group was C-MU, 57 charges or 16.8%. The remaining Special Patron lending transactions fall off sharply to faculty families, Chatham, research community (industry, etc.), Pittsburgh Theological Seminary, etc.

5. On Saturday, March 18, 30.3% of reference use was Non-Pitt patrons and Sunday, March 19, 42.6% was Non-Pitt use.

6. Pitt undergraduate reference use was highest between 12:00 noon and 3:00 p.m., rose again at 7:00 p.m. and was lightest early in the morning and after 10:00 p.m. Pitt Graduate student reference use was highest between 12:00 noon and 4:00 p.m. rose again, between 7:00 p.m. and 10:00 p.m. and dropped off dramatically after 10:00 p.m. Faculty use of reference service was the most disappointing figure of the entire week, accounting for only 3.4% of the Pitt patron use. From noon to 3:00 p.m. was consistently the highest use time for undergraduate students and all evenings undergraduate use rose again between 7:00 p.m. and 9:00 p.m., except Friday and Sunday.

7. Graphs are attached for the weekly use statistics, daily use statistics for the week, and I selected a typical day (Wednesday) for charting the hourly use of reference and lending. This day was not the highest or lowest use in either reference or lending.

8. Of all the reference inquiries the week of March 13-19,64.4 per cent concerned the card catalog and directional questions, and 35.5 per cent were reference in nature.

9. The Non-Pitt reference use on Saturday and Sunday of this week coincided well with pattern of statistics we kept of reference use on weekends for November 13 through December 5, 1971. On each of those four week-ends, Non-Pitt reference use was 25.6% for November 13-14, 30.2% for November 20-21, 25.7% for November 27-28 and 18.5% for December 4-5. Duquesne again was the highest Non-Pitt user among Pittsburgh colleges and the second highest Non-Pitt user (52). High school students were the biggest users of reference during these four week-ends in November and December, 1971. The Community College ranked third for reference use during this time period (34) and C-MU fourth (21). From there the individual institution use dropped off rapidly.

April 1, 1972
prepared by Sally L. Rowley

010

DAILY STATISTICS FOR WEEK OF MARCH 13-19, 1972

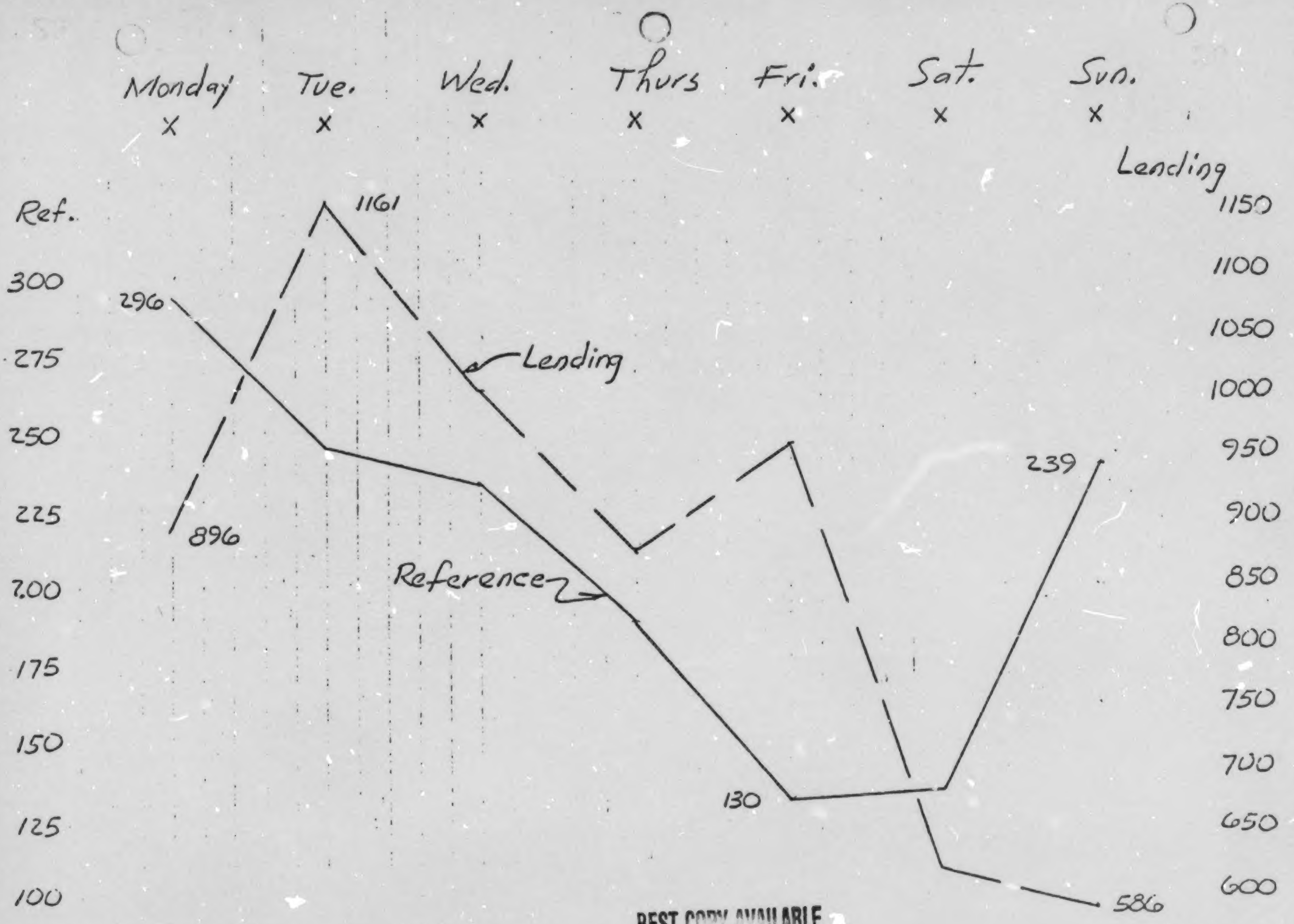
REFERENCE AND LENDING

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
Reference Use	296 or 20.19%	247 or 16.84%	233 or 15.89%	188 or 12.82%	130 or 8.8%	133 or 9.07%	239 or 16.30%
Lending Transactions	896 or 14.68%	1161 or 18.84%	1007 or 16.50%	879 or 14.40%	967 or 15.84%	618 or 10.12%	586 or 9.60%

HOURLY USE STATISTICS FOR REFERENCE AND LENDING

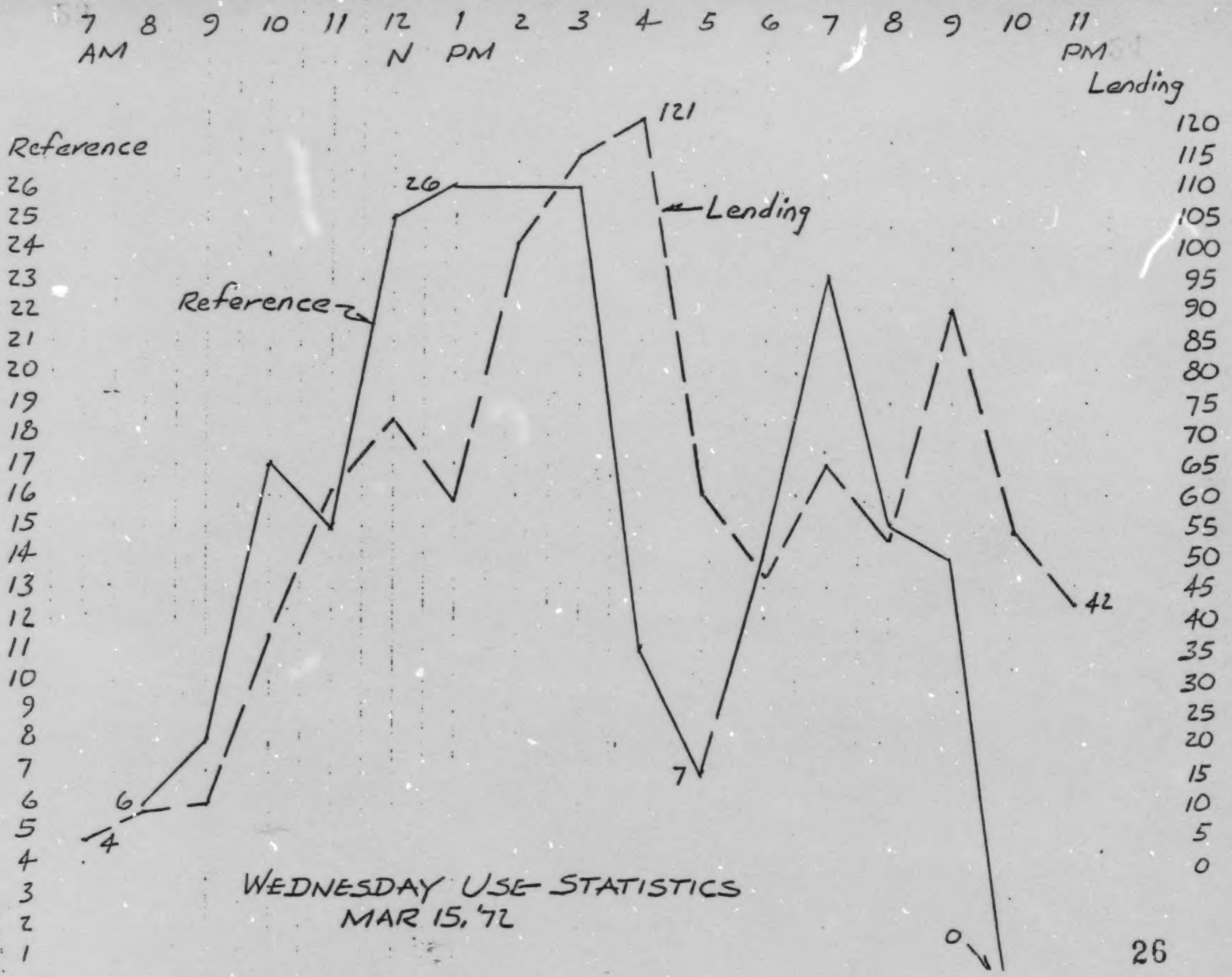
WEDNESDAY, MARCH 15, 1972

	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	12 noon	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.
Reference Use		6	8	17	15	25	26	26	26	11	7	14	23	15	14		
Total 233																	
Lending Transactions	4	9	10	37	61	73	59	101	115	121	61	48	65	57	90	54	42
Total 1007																	



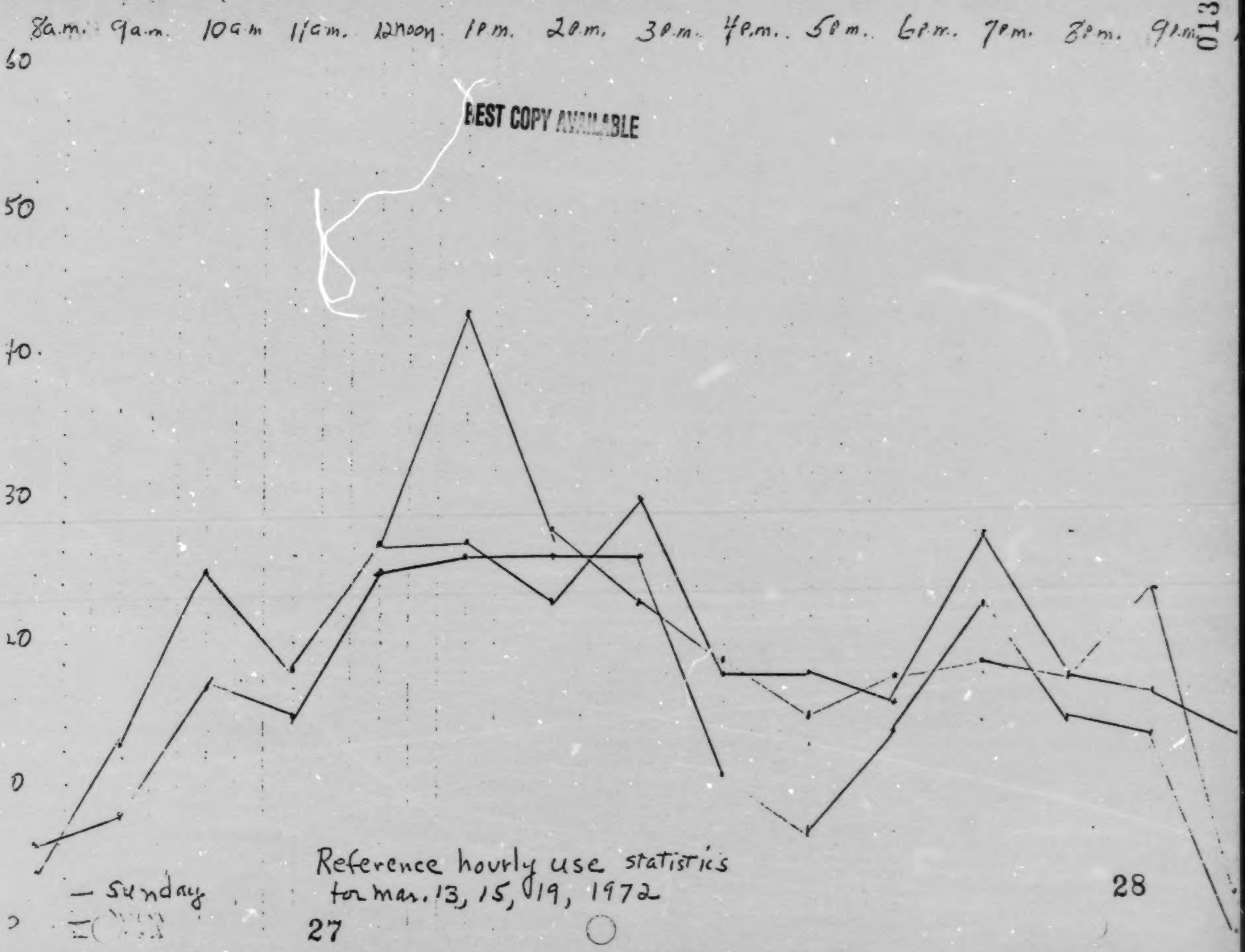
BEST COPY AVAILABLE

DAILY USE STATISTICS
MAR 13-19, 1972

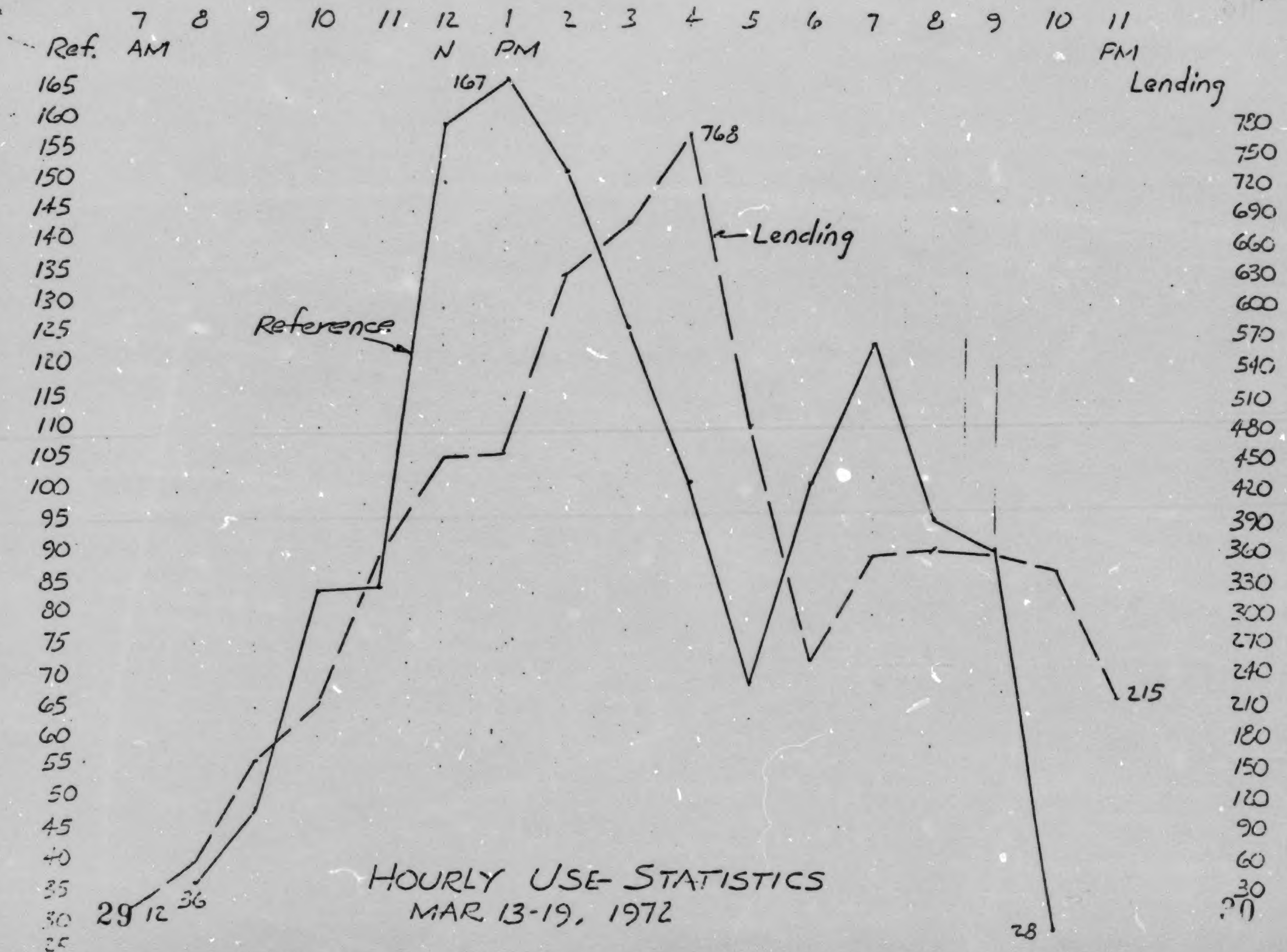


WEDNESDAY USE STATISTICS
MAR 15, '72

013



Reference hourly use statistics
for mar. 13, 15, 19, 1972



HOURLY USE-STATISTICS
MAR 13-19, 1972

SPECIAL PATRONS

	Charges	Percent of Special Patron Charges
Allegheny Community College Faculty - 4	4	1%
Alumni	75	21.9%
Bethany Faculty - 8	8	2.3%
C-MU Graduate - 47 Faculty - 10	57	16.8%
Chatham Tutorial - 22 Faculty - 3	25	7.6%
Duquesne Graudate - 84 Faculty - 12	96	28.1%
Faculty Family (Including Health Professions)	28	8.2%
Falk	6	1.7%
Pittsburgh Theological Seminary	15	4.3%
PCHE Carlow - 4	4	1.1%
Point Park Faculty - 3	3	.87%
Research	19	5.5%
Upward Bound	1	.29%
TOTAL	341	

SELECTED PORTIONS OF:

STUDY OF PURDUE
LIBRARIES STATISTICS
July 1972

INTRODUCTION

The Libraries and Audio-Visual Center Advisory Committee recommended in mid-February 1972 that IMRU undertake a study of the statistics collected by the Purdue University Libraries. Questions were asked concerning external requirements; i.e., State of Indiana, ARL, USOE, etc., the forms used for external purposes, the possibilities of standardization, and a look at the future of statistics in the library world. Internal procedures in the Purdue Libraries also were to be considered. What statistics are collected from what libraries and areas within the library system? What numbers and what levels of personnel are involved in the collection of these statistics? What are the costs per statistic, per area, per personnel level? What is the perceived accuracy and perceived usefulness of these statistics, and what forms and what methods are employed in the collection of the statistical data?

Thus, the Libraries' total commitment to statistical collection was a general unknown in terms of personnel, areas, and costs.

PROCEDURES

The problem was tackled on two fronts, external and internal. Widely varying techniques were employed in the handling of the external statistical requirements as compared with the current Purdue University Libraries internal statistical requirements.

Concerning external statistical requirements, several reports and articles were found and reviewed. Also various reporting forms used by major library statistic reporting agencies were examined.

However, the current internal statistical requirements for Purdue University Libraries was the major task undertaken in this study. After one or two false starts, i.e., failing to communicate exact intentions to Unit Heads or Heads of

017

Departmental Libraries, some direction evolved in the planning of this study. With the help of many cooperative faculty and staff, and especially Mrs. Barbara Pinzelik, a questionnaire "acceptable to all" was developed for use with the various staff members concerned with statistical data.

The preplanning was crucial for it helped eliminate most of the confusion concerning questionnaire items and also provided an extensive, although not exhaustive, list of statistics collected by the various units of the Libraries. In the later stages of the study, it was suggested that cost data might be beneficial. Although the questionnaires had been returned, it was decided to gather this data anyway, and thus, the tabulation had to be done manually.

FINDINGS

External Requirements. This task consisted of working on the external statistical requirements which the Purdue Libraries is asked to submit annually to the Indiana State Library, USOE, ARL, etc. First, the statistical reports to the Indiana State Library and USOE were completed and sent to these agencies. Of the several reports and articles examined concerning the future of library statistics one seemed especially relevant to this study. It was a report on a project sponsored by the National Center for Educational Statistics and is entitled, "Planning for a Nationwide System of Library Statistics." David G. Palmer was the Project Director and General Editor. After reading the report, and discussing the problem directly with Mr. Palmer at the 1972 ALA Chicago Convention, it is my opinion that the Library Profession is still several years from achieving a standardized nationwide library statistical program. Mr. Palmer emphasized that with the limited funds and staff currently available to NCES a real struggle exists just to maintain ground "hard won" during the past few years. Thus, for some time to come, library administrators will receive, annually, statistical forms from various agencies requiring incompatable data broken down by unique subjects and categories.

Purdue University Libraries current internal statistical requirements. There were a total of 260 statistical questionnaires sent to Library staff members who work with statistical data. Of this number, 241 were returned for a return rate of 92.7%. Each respondent was asked to give details of statistics collected and/or compiled with an indication of amount of effort involved. The dollar cost was produced by multiplying each respondent's time by the average salary rates for that personnel classification based on Fiscal Year 1971-72 data supplied by Charles Long. These costs are a severe underestimate of the actual cost to Purdue because no allowance was made for overhead, fringe benefits, etc.

Unfortunately, respondents were asked to give the total effort devoted to statistics rather than a breakdown of the effort devoted to each. This breakdown was achieved after the fact by simply dividing the effort by the number of statistics handled; e.g., if one person handled two statistics, their effort was divided by two to give an assumed effort for each statistic. This was done to save effort. It assumed that each statistic required a similar amount of effort. The effect of this action is to underestimate somewhat the cost of time-consuming statistics and to overestimate somewhat the cost of less time-consuming counts. However, the sum total of effort devoted to statistics will not be affected.

Time, degree of accuracy, and perceived usefulness figures represent pure subjective estimates provided by each respondent. In addition, each respondent listed their most commonly used method of collection and, for this report, the method listed by the respondent was reported for each statistic with which that individual worked. Perceived accuracy figures were provided for this report in much the same manner, i.e., if a respondent reported that they worked with five statistics and that their degree of accuracy for the collection of statistics was 80%, then this overall 80% figure was reported for all five statistics.

If should be stressed that more precise data could be collected on specific details if this is deemed worthwhile.

Following is a summary listing of the major statistics collected by the Purdue Libraries. Included in this summary is information concerning: personnel level, location, estimated annual time, estimated annual cost, method of collection, perceived accuracy, and perceived usefulness.

Following the summary listing of statistics is a short conclusion section listing a few brief recommendations. This section is followed by the Appendices. Appendix A contains a detailed analysis of each statistic by location, respondent, time, cost, etc. Appendix B contains copies of the major forms used in the collection of the statistics.

Name of Statistic	Personnel	Estimated Annual Time		Estimated Annual Cost	Most Common Method of Collection	Average Perceived Accuracy	Perceived Usefulness Trends
		Hrs.	Mins.				
Supplies used	19	707	30	$ 1651.46	Continuous	78%	Usually
Patrons entering or leaving the library	117	4308	30	9795.03	Continuous	79%	Usually
Books and periodicals checked out	121	2578	15	5953.08	Continuous	80%	Usually
Books shelved (picked up from table)	78	2465	0	6833.66	Continuous	81%	Usually
Xerox requests	45	640	45	2102.38	Continuous	78%	No Trend
Copies made	37	642	0	1637.07	Continuous	78%	No Trend
Ready reference	81	1019	0	2826.88	Continuous	79%	Usually
Search reference	81	1052	45	2904.89	Continuous	78%	Usually
Informational or directive requests	78	800	45	2159.13	Continuous	77%	No Trend
Catalog information requests	22	213	30	627.80	Continuous	76%	No Trend
Number of periodical volumes shelved	53	1206	30	3250.90	Continuous	80%	Usually
Interlibrary loan requests	17	252	15	680.39	Continuous	79%	No Trend
Reserve books circulated	115	2131	15	4914.00	Continuous	81%	Don't Know
Circulation of unbound current journals	87	1546	15	3791.09	Continuous	80%	No Trend

Name of Statistic	Personnel	Estimated Annual Time Hrs.	Mins.	Estimated Annual Cost	Most Common Method of Collection	Average Perceived Accuracy	Perceived Usefulness Trends
Serial items and monographs circulated by subject classification	30	418	0	$ 1317.74	Continuous	80%	Always
Requests for reports and reprints received from outside Purdue and number of those that we are able to fill	10	195	45	490.50	Continuous	78%	Don't Know
Reports, reprints, etc. requested by Purdue staff from outside sources	9	124	30	278.65	Continuous	74%	No Trend
Literature searches requested by Purdue staff from outside sources	9	69	30	193.68	Continuous	76%	No Trend
Technical reports added per year	8	93	15	252.42	Continuous	78%	Don't Know
Money spent on library materials by subject area within the department	5	15	15	62.70	Continuous	75%	Always
Miscellaneous Statistics*	60	3426	0	9318.98	Continuous	82%	
GRAND TOTAL READERS DIVISION	208	23,906	30	$ 61,042.43	Continuous	78%	

*Specific statistics listed in Appendix A (pp. 119-133).

Name of Statistic	Personnel	Estimated Annual Time Hrs.	Estimated Annual Time Mins.	Estimated Annual Cost	Most Common Method of Collection	Average Perceived Accuracy	Perceived Usefulness Trends
Number of volumes processed	3	72	15	$ 201.75	Continuous	100%	No Trend
Total volumes cataloged	3	72	15	201.75	Continuous	100%	No Trend
Volumes withdrawn	2	3	15	8.04	Continuous	98%	No Trend
Volumes reinstated	2	3	15	8.04	Continuous	98%	No Trend
Location statistics broken down by departmental libraries and regional campuses	5	35	15	95.44	Continuous	99%	Always
New titles--purchases, gifts, depositories	3	72	15	201.75	Continuous	100%	No Trend
Adds--purchases, gifts, depositories	3	47	15	132.25	Continuous	100%	No Trend
Analytics--sets of cards produced for union catalog	2	2	15	7.15	Continuous	95%	No Trend
Analytics--total number of sets of cards produced	3	5	15	13.50	Continuous	95%	No Trend
Analytics--number of serials analyzed	1	0	15	1.59	Continuous	100%	No Trend
Microfilms and non-book materials--titles cataloged	3	56	15	127.03	Continuous	100%	No Trend
Microfilms and non-book materials--number of	4	95	15	234.45	Continuous	100%	No Trend

Name of Statistic	Personnel	Estimated Annual Time Hrs.	Mins.	Estimated Annual Cost	Most Common Method of Collection	Average Perceived Accuracy	Perceived Usefulness Trends	QN
Miscellaneous Statistics								
Reclassification	1 Cl	3	0	$ 6.45	Continuous	95%	Usually	246
Recutter	1 Cl	3	0	6.45	Continuous	95%	Usually	246
Transfers from main catalog to serials	1 Cl	3	0	6.45	Continuous	95%	Usually	246
Transfers from one area to another	1 Cl	3	0	6.45	Continuous	95%	Usually	246
CARD PREPARATION AND CATALOG UNIT TOTAL	9	477	0	$ 1258.54	Continuous	98%		

I. Type of question.
  1. Directional
  2. Ready Reference (answerable in a short time from sources readily available)
  3. Reference (requires searching materials not readily available and/or requires more than a short time to answer)
  4. Extended Reference (requires preparatory work such as might be required for a Reference Rap or compilation of a bibliography)
  5. Referral (the patron was referred to an outside agency or person)
  6. Library Instruction (requires instructing patron in use of library materials, or in techniques of library research)

II. Source of Question
  1. In person
  2. Telephone
  3. Mail

III. Date & Time
Note: Date need only be listed once, but specific time of day should be noted for each question.

IV. Time Spent
  1. Less than 1 minute.
  2. Less than 5 minutes, but more than 1 minute.
  3. Less than 10 minutes, but more than 1 minute.
  4. Less than 20 minutes, but more than 10 minutes.
  5. Less than 1 hour, but more than 20 minutes.
  6. More than 1 hour.

V. Topic
Note: Briefly state the question or the information sought.

VI. Patron Consulted Previously (use codes in VII below)

VII. Sources Consulted (+ = information found, - = information not found)
  1. CC = Card Catalog
  2. IF = Information File
  3. COL = College & University Catalogs & Directories
    a. bulletins (Don't be specific)
    b. College Bluebook
    c. Others (name)
  4. IND = Periodical & Anthology Indexes and Current News Sources
    a. Abridged Index Medicus
    b. Bibliographical Index
    c. Biography Index
    d. CIJE
    e. Education Index
    f. Essay & General Literature Index
    g. Facts on File
    h. MLA International Bibliography
    i. Newsbank
    j. PAIS
    k. Play Index
    l. Psychological Abstracts
    m. Readers Guide
    n. Social Sciences & Humanities Index
    o. Speech Index
    p. Other (name)

VI. Sources Consulted (continued)

5. AL = Almanacs & Yearbooks
    - a. Europa Yearbook
    - b. Information Please Almanac
    - c. Official Assoc. Press Almanac
    - d. World Almanac & Book of Facts
6. ENC = Encyclopedias
    - a. Americana
    - b. Britannica
    - c. Colliers
    - d. Enc. of Associations
    - e. Enc. of Education
    - f. Enc. of Social Work
    - g. Enc. of Sports
    - h. Int. Enc. of Social Sciences
    - i. McGraw-Hill Enc. of Science & Technology
    - j. Readers Enc. of Shakespeare
    - k. Textbook of Medicine
    - l. Other (name)
7. HB = Handbooks
    - a. Asimov's Guide to Shakespeare
    - b. CRC Handbook of Chem. & Physics
    - c. CRC Handbook of Tables for Math
    - d. Familiar Quotations
    - e. Magill's Quotations in Context
    - f. Masterpieces of World Lit.
    - g. Masterplots
    - h. Merck Index
    - i. Official Rules of Sports & Games
    - j. Periodical Title Abbreviations
    - k. Standard Book of Shakespeare Quotations
    - l. Other (name)
8. DIC = Dictionaries
    - a. Black's Medical Dictionary
    - b. Dict. of Am. Slang
    - c. Dict. of Geography
    - d. Funk & Wag. Standard Dict. of Folklore, Mythology, & Legends
    - e. Mathematics Dict.
    - f. Oxford Eng. Dict.
    - g. Random House
    - h. Webster's IIIrd
    - i. Other (name)
9. AG = Atlases & Gazateers
    - a. National Geographic Atlas of the World
    - b. Rand McNally International Atlas
    - c. Rand McNally Road Atlas
    - d. Times Atlas of the World
10. BC = Bible Concordances (name)
11. BIB = Bibliographies
12. BIO = Biography Sources
    - a. Current Bio.
    - b. Dict. of Am. Bio.
    - c. Dict. of Nat. Bio.
    - d. Dir. of Am. Scholars
    - e. Who Was Who
    - f. Who Was Who in Am.
    - g. Who's Who
    - h. Who's Who in Am.
    - i. World of Learning
    - j. Other (name)

026

REFERENCE TALLY SHEET

Name______________________________________

QUESTION TYPE	QUESTION SOURCE	DATE & TIME	TIME SPENT	TOPIC	PATRON CONSULTED PREVIOUSLY	SOURCES CONSULTED (- = information not found)

49

50

Includes questions answered about the location of specific people or places; questions which do not require the interpretation of library service and do not include even the simplest tools.

Some examples of Directional questions:

1. "Where's the pencil sharpener?"
2. "Where can I find Mrs. ________?" or "Where is the Administration Office
3. "Where's the Business Library?"

Circulation:

A. Includes requests for materials on Reserve, in Ready Reference, or in offices, file cabinets, etc., which are inaccessible to the user. These would normally be asked for by name or in another positive way and would ususally require no further action beyond locating the materials and handing them to the user.

B. Includes questions which require the consulting of an internal file not open to the public, such as the Kardex, process file, shelf list, circulation file, bindery file, etc., concerning a specifically requested library resource.

C. Includes questions which require an answer in terms of the library rules.

Some examples of Circulation questions:

1. "Do you have Prof. ____________'s book on reserve?"
2. "Is the almanac behind the desk?"
3. "Can I take out this periodical?"
4. "Will you trace (recall) this book for me?"
5. "Can I take this to Xerox?"
6. "Can you put this book on reserve for me?"
7. "Where do I return books?"
8. "I got this notice of a fine. . ."
9. "Will you order . . .? It's not in the card catalog?"

Instructional:

Questions which require teaching the use of a common tool in one's own department, i.e., SBC, indexes, catalogs, the card catalog, etc. This includes instruction in the use of AV equipment, microreaders, or the Locator in CD. (When not used in an instructional way, e.g. when answering a telephone query, the Locator should be recorded in the Circulation box).

Some examples of Instructional questions:

1. "I have a title but no author; how do I find the book?"
2. "How do I find (name of magazine)?"
3. "I need articles on Watergate."
4. "How do I use the microfilm machine?"
5. "I've never used a copying machine before."

Research:

More complicated than an instructional question, answering the Research question should include the use of more than one tool. The question will lead to the use of lesser known as well as more specialized tools.

Some examples of Research questions:

1. "I have to do a paper on the Black Hole theory."
2. "My term paper is on participatory management."
3. "I'm doing a biography of B.F. Skinner."

Please note: Referral questions may fit into any of the four basic types above, and should be classified according to the type of answer required, e.g.:

Directional: You give directions to the user to find the location referred to by the Public Catalog or the SBC.

Instructional: You advise the client to go to another department, because you know that the general material sought is located there.

Research: You cite one or more specific tools and send the client to the place they can be found.

Circulation: You tell the user where to return his books or where to get information on circulation policies.

NORTHWESTERN UNIVERSITY

Northwestern University Library
Policy Statement #

Issued by: John P. McGowan, University Librarian

Topic: Library Statistics Program

Descriptors: statistics

POLICY: (followed by procedures and historical notes when applicable)

The following activities have been identified for the Library's statistics program, effective September 1, 1975. Several categories previously reported will be dropped. Each department head is requested to submit a periodic report detailing numerically (and in narrative fashion where appropriate) the extent of these activities in his/her department. The periodic report should be submitted to Bruce Miller, Administrative Assistant within 7 working days after the end of each period. The actual dates the reports are due are listed on the Administrative Calendar.

Following is a list of categories which should be included, along with the names of those departments which provide that particular information. If there are any errors or omissions, please bring them to the attention of the Administrative Assistant.

I. Public Service Statistics

1. Circulation--internal (number of pieces used within the building but not checked out) and external (number of pieces checked out).

   Africana (internal only), Art, Circulation, Core, Curriculum, Government Publications, Listening, Management, Map, Music, Newspaper/Microtext, Periodicals, Poetry, Reference, Reserve, Schaffner, Science Libraries, Special Collections, Tech, Transportation, and University Archives.

   Internal circulation should be estimated by a count of the number of items reshelved.

2. Reference questions asked--three categories of information should be reported.

   (1) mode of question--in person, by phone or letter?
   (2) affiliation of requestor with Northwestern--NU student, NU faculty, NU other, non-NU, or unknown?
   (3) type of question--information, holdings, instruction, ready reference, substantive reference? (See definitions of these terms in Appendix)

   Africana, Art, Core, Curriculum, Government Publications, Management, Map, Music, Reference, Schaffner, Science Libraries, Special Collections, Tech, Transportation, University Archives.

   If this information is not being compiled at present, a schedule will be provided by Bruce Miller for sampling random time intervals so that use might be estimated. See Bill Jones' "A Time Series Sample Approach for Measuring Use in a Small Library," Special Libraries, vol. 64, no. 7 (July, 1973), pp. 280-284, for a description of a technique.

Bibliographers, the African-American Studies Librarian and the Public and Urban Affairs Librarian should report the total number of hours spent giving public assistance.

This category will be reported annually, rather than by report period.

3. Number of persons occupying an area.

   Africana, Art, Core, Curriculum, Government Publications, Listening, Main (count of persons entering), Map, Management, Music, Newspapers/Microtext, Periodicals, Poetry, Reference, Reserve, Schaffner, Science Libraries, Special Collections, Tech, Transportation, and University Archives.

   For Public Services, Transportation, Management, Music and Schaffner, a count should be taken at fixed times (to be supplied). Other branch libraries should report a count of the total occupancy per day.

5. Interlibrary Loan--number of hard copies and number of photocopies borrowed by NUL; number of hard copies and number of photocopies requested but not received by NUL; number of hard copies and number of photocopies loaned by NUL; number of hard copies and number of photocopies requested but not loaned by NUL.

   Break out first two categories by requests to the Center for Research Libraries and requests to all others.

   Interlibrary Loan, Schaffner, Tech and Transportation.

6. Descriptions of exhibits, Faculty Lounge, and Forum presentations.

   Africana, Special Collections, Undergraduate Services, Curriculum, Map.

7. Descriptions of bibliographies, guides, newsletter, significant policy statements, and other publications produced.

   All departments.

8. Library instruction and orientation--number of groups and number of persons in groups receiving instruction and orientation.

   All Public Services departments.

9. Computer-based information service--number of batch and number of on-line searches, each divided into current awareness and retrospective searches.

   Count separately for Tech and Main Library.

II. Technical services statistics

1. Number of pieces received.

   Africana, Curriculum, Government Publications, Listening, Map, Music, Newspaper/Microtext, Order, Special Collections, Transportation.

2. Number of titles cataloged.

   Catalog, Curriculum, Government Publications, Listening, Music, Transportation.

3. Number of orders placed.

   Government Publications, Order, Transportation.

An Informal Report

I. INTRODUCTION

This Survey was conducted in the Loan Department during the last twelve weeks of Winter quarter 1969. It undertook to analyse every request for Loan Stack material in terms of whether or not the request was filled, when it was filled, and , if unfilled, why it was unfilled. In terms of additions to regular Loan Department procedures what this meant essentially was the searching of every unfilled request, rather than just those for which search was requested. The mechanical innovation that enabled the staff to process these searches was the installation of a Xerox 914 in the Loan Department work area, equipped with Xerograkards (four-up) and appropriate masks. This enabled specially trained Loan Department personnel to Xerox copies the size of IBM cards of every unfilled request represented by a call card filled in by a (sometimes would-be) borrower (sample included). Each of these Xerograkards was then searched, appropriately coded, and eventually tabulated. Most, of course, were not "searched" in the proper sense, for the status of the requested material was generally determined by a file check.

The procedure followed was fairly elaborate, and the information gathered has a high degree of reliability. The Survey revealed nothing particularly startling nor surprising (nor was it expected to), unless it was the empirical verification of what we had always "felt" was a respectably high level of service, in terms of ratio of requests filled to requests unfilled, provided by the Loan Department. That ratio turned out to be 3.05 to 1, or 75.29 percent of all requests filled.

With more sophisticated data processing capabilities, and more manpower, a survey such as this might reveal additional useful, and certainly interesting, information. For instance, it might be of value to correlate type of borrower requesting, type of material requested, and, in those cases where applicable, type of borrower who already had the material charged out. A useful refinement would be to know exactly how many titles and how many borrowers were involved. Although it was not included as a part of this Survey, we could still analyse the collected Xerograkards in terms of type of material requested, type most often out to another borrower, missing or lost, found misshelved, etc.

But, despite such limitations of the Survey, all of which were known in advance, it was all in all a productive and useful venture. A very large measure of credit for the success of the Survey belongs to Mr. Walter Crawford, Head of the Circulation Control System division, who designed and maintained the data-gathering apparatus, Mrs. Ruth Reynolds, Head of the Circulation Division, and Mr. Kenneth Legg, Head of the Stack Division. All three were resourceful and efficient in working out details and tightening up routines. Mr. Gene Ellis' Search Desk capably handled some 15,000 more items than usual. The Survey was conducted under my general supervision, and its shortcomings are mine.

Following the tabular presentation of the Survey results (next page) is an item by item commentary.

RESULTS OF LOAN DEPARTMENT SERVICE SURVEY, WINTER QUARTER 1969

12 weeks

	NO.	NO.	NO.	NO.	% of Total	% of Unfilled	
Total requests				141,779	100.00	--	(1)
Total filled			106,742		75.29	--	(2)
Filled at time of request		96,143			(67.81)	--	(3)
Filled later		10,599			(7.47)	--	(4)
Recalls	6,904				(4.87)	--	(5)
ICLF(N)	3,695				(2.61)	--	(6)
Total not filled			35,037		24.71	100.00	(7)
Out to another borrower		16,313			11.50	46.56	(8)
Faculty	2,830				(2.00)	(8.08)	(9)
Other	13,483				(9.51)	(38.48)	(10)
Departmental charges					2.78	11.23	(11)
RBR	2,834[a]	3,936			(2.00)	(8.09)	(12)
Branches, HGS, etc.	1,102[a]				(0.78)	(3.14)	(13)
Incorrect information		3,909			2.76	11.16	(14)
On shelf when searched		3,275			2.31	9.35	(15)
From Loan Desk	819[b]				(0.58)	(2.34)	(16)
From stack info. desk	2,456[b]				(1.73)	(7.01)	(17)
Missing or lost		2,394			1.69	6.83	(18)
Missing	1,487				(1.05)	(4.24)	(19)
Lost	907				(0.64)	(2.59)	(20)
ICLF(N)		1,734			1.22	4.95	(21)
Report given, not paged	37				(0.02)	(0.11)	(22)
No report to patron	1,697				(1.20)	(4.84)	(23)
No such book		816			0.57	2.33	(24)
Misshelved		776			0.55	2.21	(25)
On hold shelf		567			0.40	1.62	(26)
Bindery or cataloging		403			0.28	1.15	(27)
Bindery	383[c]				(0.26)	(1.09)	(28)
Cataloging	20[c]				(0.02)	(0.06)	(29)
Int. Lib. Lndg. or Lib.		294			0.21	0.84	(30)
Photo. Service							
ILL	265[d]				(0.19)	(0.76)	(31)
LPS	29[d]				(0.02)	(0.08)	(32)
Tubs on tier		258			0.18	0.74	(33)
Out to same borrower		238			0.17	0.68	(34)
Fourth tier returns		124			0.09	0.35	(35)

a. Distribution projected from estimated total RBR and other departmental charges.
b. Based on estimated distribution of source of request.
c. Based on sample of 246 instances, of which 236 were bindery.
d. Based on sample, of which 90% were ILL

II. COMMENTARY AND DESCRIPTION OF CATEGORIES

(1) It is estimated that this number represents more than 95 percent of all requests received. The remainder were not included in the survey for such reasons as Xerox machine downtime, or that cards were damaged. For purposes of statistical consistency, one fairly sizeable adjustment has been made in this figure. In the normal borrowing procedure there are what amount to two requests (call cards) for each item that is recalled, and for each item from ICLF(N). The actual number of call cards counted in the Survey thus includes 10,599 requests counted twice. The total number of requests, for tabulating purposes, was therefore reduced by that number. The total number of requests split almost evenly between the Loan Desk (paged items) and in the stacks (self-service): 72,324 of the former, 71,189 of the latter.

It must be remembered that throughout the Survey, all data represent instances, not books. It was not possible, with available resources, to determine how many times any given book or title was involved, nor how many borrowers.

(2)-(4) Evaluation of these statistics is bound to be subjective to some degree, there being no "standard" of service to use as a norm. It can be argued that filling a little over 2 out of 3 requests immediately, and 3 out of 4 either immediately or after some delay, is not the best of service. It is probably not the best, of course, since the chimeric ideal of 3 for 3 or 4 for 4 will always--and maybe should always--exist. However, there are different ways of looking at service, and different ways of looking at the figures generated by this Survey. Comment here will be restricted to the figures.

(5)-(6) The total number of books which were recalled and held was 6,904, 42 percent of the 16,313 (out to other borrower) books that were recallable. Of this number, 4,500, or 65 percent, were eventually claimed by the borrower requesting the recall. Thus, only the latter figure represents "circulation", but the 6,904 were counted as filled requests since the Loan Department did supply the desired material, although perhaps not when the borrower wanted it.

Material in storage represented 3.83 percent of all requests, and almost 35 percent of all requests filled but not at time of request. It is perhaps significant that of requests reported to borrowers to be in ICLF(N), 99 percent were elected to be paged, and of these, 95 percent were borrowed. An obvious comparison to be made here is with the low recall and circulation rate of recallable items. It would seem that people are not put off by the delay in getting items from storage (usually one day), but that the usual 8 to 21 day delays in recalls (caused mostly by lack of borrower response) lead many people to forego this option. That recalls are an intractably unsatisfactory facet of Library service is a persistent fact of life that all concerned must probably just learn to live with. Duplication, "Library Use", and placing on reserve are partial solutions only, and generally, when applied, are the result of hindsight. Consistently accurate and economical foresight in these matters is not among the ordinary attributes of mere men. A thorough study and analysis of recalled items might well be productive, nevertheless.

(7) The figure for unfilled requests includes an unascertained number of unfilled requests that eventually circulated as a result of the search routine, return from bindery, located on shelf on second try, etc. In other words, some of the 106,742 filled requests may have been tallied first as unfilled (besides the recalls and delayed paging), and, resubmitted later, been tallied as filled at time of request. In the opinion of those who conducted the Survey, the number of resubmissions that duplicate a previously unfilled request would have been small enough to be considered trivial.

Each category of "unfilled" status will be briefly described, in order, below, following which will be some discussion in terms of service and Loan Department operations.

(8)-(10) By far the largest single reason for unfilled requests is that someone else has checked out the book, and yet the chances are only about 12 in a hundred that this will be the case. It is interesting to note that in 1968/69 Faculty charges accounted for 8.5 percent of total Loan Department circulation, and in the Survey, Faculty charges accounted for nearly 8.1 percent of unfilled requests. However, of all requests unfilled because material was charged out to another borrower, the borrower was Faculty in 17.35 percent of the instances. A sample of 2,291 Faculty charges among the "Out to Another Borrower" group indicated that 863 (37.7 percent) had been out over six months, using March as the reference month. The range was from less than two weeks, to ten years. The "due" dates, with number of charges and percent of total were:

Jan, Feb, Mar 1969	840	36.66
Dec 1968	250	10.91
Nov 1968	153	6.68
Oct 1968	185	8.07
Sep 1968	88	3.84
Aug 1968	118	5.15
Jul 1968	86	3.75
Jun 1968	49	2.14
May 1968	45	1.96
Apr 1968	34	1.61
Mar 1968	28	1.22
Feb 1968	36	1.57
Jan 1968	45	1.96
1967	185	8.07
1966	62	2.70
1965	48	2.09
1964	18	0.78
1963	6	0.26
1962	3	0.13
1961	7	0.30
1960	3	0.13
1959	2	0.02
	2,291	100.00

(11)-(13) These items are self-explanatory.

(14) "Incorrect information" means that some part of the information supplied by the borrower on the call card was sufficiently incorrect to prevent either finding the book on the shelf or determining whether or not it was charged out. In all of these instances correct information was subsequently supplied by Loan Department search staff using the shelflist, card catalog, and imagination. (See Item (24))

(15)-(17) All instances in this category were requests that were originally reported not-on-shelf (NOS) and not-in-files (NIF) and, when thence shunted into the search routine, were found on shelf. These data are perhaps the least reliable in the whole survey, and yet can by no means be ignored. The unreliability is not in the total number found on shelf, for that is a simple tabulation of verified instances. The unreliability resides first of all in the distribution of these instances between Loan Desk and Stack Information Desk, and secondly in the time factor influenced by the quantity of material handled in the Survey. It is not known how many of these NOS's were so determined by Loan Department pages (working from the Loan Desk), and how many by patrons with stack access who reported the book NOS to the Information Desk. To distribute these nearly half-and-half on the basis that this was the distribution of the total number of requests seemed a bit arbitrary in light of the fact that the pages are trained (although perhaps not strongly motivated), and the patrons are untrained (although perhaps strongly motivated). Thus the 25/75 percent distribution shown takes on the somewhat suspect coloration of an educated guess. The time factor causes doubt because there were occasions when there was enough delay between the reporting of the NOS and its searching that the book might well have reached the shelf in the interim, and in fact not have been on the shelf when first sought.

(18)-(20) Here is a matter of clarifying Library jargon. In local parlance a book is "missing" when, having been searched four times, a card for it is entered in the main charge file, where it remains for a maximum of three months. A book is called "lost" when it is not found in a search at the end of the three month period. It is then considered for replacement, and the card may remain in the file for a year. For all practical purposes, "missing" and "lost" are the same in terms of availability of the book.

(21)-(23) In 37 instances when the borrower asked for a report on a book that was NOS, that book turned out to be in storage and the borrower declined to have it paged. In the 1,697 other instances involving undelivered storage items, the borrower, upon learning the book was NOS, did not request further checking.

(24) The "No Such Book" category differs from the "Incorrect Information" category in that the Loan Department search staff could not, in these instances, verify or correct any of the information on the card.

(25) This item is self-explanatory.

(26) The hold shelf, which might have something on the order of 300 volumes on it at any given time, is not checked in the routine of paging and giving reports.

(27)-(29) These items are self-explanatory.

(30)-(32) These items are self-explanatory.

(33) This designation, like (35), is for one stage in the process of shelving returned books.

(34) This item is self-explanatory.

(35) See (33).

III. DISCUSSION OF UNFILLED REQUESTS

The purpose of this Survey was to gather quantifiable information that would help the Loan Department assess how well it was performing its assigned functions. The key to this assessment is as much in the record of unfilled requests as it is in the record of filled requests, if not more so. This discussion, then, will examine the record in terms of Loan Department responsibility, in order to arrive at what might be called the hard-core of the Library's nonfeasance--the failures it might be expected to take steps to remedy.

It should be made clear at the outset that the following interpretations are mine, and are made in full acknowledgment that they are influenced by a firm convinction that there is and always will be a certain irreducible minimum of unfilled requests, even within the categories for which the Loan Department might be termed responsible for the service failure.

First, let us eliminate those categories of unfilled requests where the Loan Department's degree of "fault" is nil or at least minimal. There are seven of these, totalling 27,697 requests:

1. Out to Another Borrower; 16,313 instances. It is reasonable to assume that had there been duplicates of the titles involved here, some of the requests would have been filled when first requested. It is not reasonable to assume, however, that the Library should have had duplicates of all the titles involved. The Library provided probably immediate service to someone in most of these cases, or they would not be cases, and in 6,904 of them provided delayed service. In an operation where the optimum performance must of necessity fall short of maximum performance (any research library--maybe any library of any kind--is this sort of operation) this ratio of coincident wants among the clientele must be well within acceptable parameters.

2. Departmental Charges; 3,936 instances. Although not available from the Loan Department, all of this material was available somewhere in the General Library. There is probably a high rate of duplication of requests here, considering the nature of undergraduate assignments. Since there are something on the order of 15,000 departmental charges in the file, even if there were no duplication of requests it would mean that only a little over one fourth (26.2 percent) of the dislocated books were the cause of any service failure on the part of the Loan Department. The matter of whether or not there should be as many as 15,000 departmental charges raises questions that really go beyond the scope of this survey--questions having to do with the complexities of collection building in a library that must serve well the needs of both teaching and research.

3-6. Incorrect Information; 3,909 instances; On Shelf When Searched (from Information Desk); 2,456 instances; No Such Book, 816 instances; Out to Same Borrower, 238 instances. These categories represent 7,419 instances of borrower error (with the aforementioned caveat about "On Shelf When Searched"). These cost the Library money, and likely frustrate the borrower and hurt his pride, but to try seriously to rectify the situation would be a sure path to despair.

7. Out to Library Photo Service; 29 instances. Hardly worth counting, these instances would cause little delay, and are in effect "Out to Another Borrower". (For interlibrary loans, see No. 7, below.)

There remain 7,340 unfilled requests, in nine categories, which represent 5.18 percent of total requests, and 20.95 percent of unfilled requests. In all of these, the responsibility (or culpability) seems clearly to be the Library's, and/or will most certainly be so deemed by the borrower. In some cases it is clearly so, and in others it is a matter of degree. The eight categories are:

1. Missing or Lost; 2,394 instances. Of this number, 907 were found to be already among the officially "lost", and 1,487 were "made missing" as the result of search procedures. If 1,487 books were thus not found, in preliminary search, past performance indicates that 1,200-1,250 of them would be found by the fourth search, at which juncture they would, if not found, have been "made lost". It should be remembered that these figures, like all others in the Survey, do not represent books, but represent instances, as there was almost certainly some duplication of requests.

The significance of the lost and missing figures would seem to lie in that (1) they point up the economy of not rushing material into a "replacement authorized" status and (2) they indicate that whereas lost or missing books do represent a service failure on the part of the Loan Department (although not necessarily on the part of the General Library as a whole) the apparent odds of about 49 to 1 against a desired book being lost or missing are actually pretty good odds (Missing or Lost equal 1.69 percent of all requests). However, the "Lost" statistic (907) raises the question of whether or not the Library, since it has taken official cognizance of the fact that material it claims in the catalog to have is in actuality not available, might not give better service by devising some way to indicate this in the card catalog.

[illegible] is to be
discarded, nothing
done to catalog,
if not to be [illegible]
([illegible]) [illegible]
[illegible]

When a book is NOS and NIF, and is not found in search, it is not necessarily negligence on the part of the Loan Department that brought this about. Nonetheless, the most embarrassing statement a Loan Department can make is "We don't know where it is", and most users are adept and unhesitant in leveling incrimination.

2. In ICLF(N); 1,734 instances. The instances in which a borrower elected not to have a book paged from storage indicate probably some truly immediate needs (or great impatience) on their part. Since this occurred in only one percent of the instances where the borrower was told the book was in storage, it cannot be considered a serious service failure. The nearly 1,700 other instances, however, are another matter.

   When a book is reported NOS, the storage file is not checked unless the patron requests a file check at the time he presents his call card, when he is asked whether or not he wishes a full report (most do). The Loan Department might do well to institute the policy of checking the storage file as a matter of routine whether requested or not, since one can infer from the Survey figures that nearly all who learned a book was in storage would have it paged and would use it.

3. On Shelf When Searched (from Loan Desk); 819 instances. It can only be hoped that training and individual diligence will combine to reduce this figure, or at least keep it low.

4. Misshelved; 776 instances. There really isn't much to say about a misshelved book. Anyone--staff or patron--can put a book in the wrong place. The occasionally encountered phenomenon of random shelving is, in the present state of our art, essentially mysterious and will always be one of the minor trying puzzlements of an

operation such as Loan Department's. That the Survey figure is so low (about one half of one percent of all requests, two percent of recorded circulation during the period) is no doubt attributable to the then current stepped-up campaign of regular systematic shelf reading . It could probably be demonstrated that regular systematic shelf reading saves money (mostly in searches) as well as improved service.

5. On Hold Shelf; 567 instances. NOS's are not routinely checked against the hold shelf because it has always been felt that (a) with only about 300 volumes on hold at any given time the chances of requested material being there were slim, and (b) if the requested material were there, it would amount to being out to another borrower, and therefore would be unavailable for the duration of the hold period plus a nominal fourteen day loan period. The payoff in service for the added work and delay of checking every NOS against the hold shelf would seem scarcely worth it.

6. Bindery or Cataloging; 403 instances. It is inevitable, in the library scheme of things, that some material placed in circulation must be withdrawn for cataloging, repair, or binding (the care-and-feeding routine). Not unexpectedly the large majority of those turned up in the Survey were bindery charges, mostly monographic. If one can assume a high correlation between use and need for repair, then we will always have the contrary situation where some of the material most in demand will be unavailable not because it is in use, but because it has been in demand and overused.

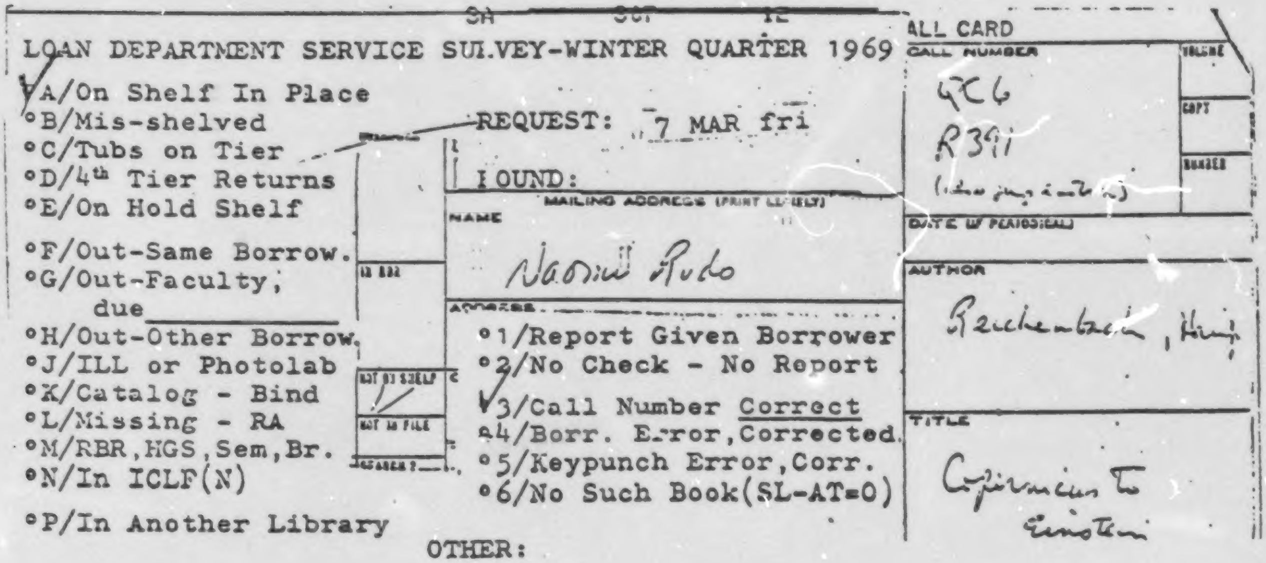
7. Interlibrary Loan; 265 instances. This category is included here, rather than in "Out to Another Borrower", because it generally represents service provided to users least immediately connected with UCB, and thus, perhaps, of a lower order priority in the ranking of those to whom the Library offers service. (It is true, however, that other UC campuses--big ILL customers--have, by fiat, a certain high in-family standing.) One might argue with some validity that many Special and most Reference borrowers are also toward the far end of the wide spectrum of library privileges we accord our highly heterogeneous clientele. But the fact remains that they are here, and the books they use are at least theoretically more easily retrievable (certainly so with Reference borrowers).

The total ILL figure is relatively low, and probably indicates only that people who can't find what they want in their own libraries, and want something that CU will lend, do not seem very often to want the same material wanted by CU's on-the-scene patrons. This is an imponderable. Nevertheless, 265 disappointments brought about by our fulfilling a function that is at best secondary among the Library's roles indicate that serving the scholarly and research community at large is not without its cost in terms of local effectiveness. In addition to this consideration, one cannot overlook the traumatizing effect on some prime patrons when they learn that what they want has been wilfully (albeit generously) sent off to London, Leningrad, Shell, or the misty slopes of Humboldt State.

8-9. Tubs On Tier; 258 instances; Fourth Tier Returns; 124 instances. These waystations in the central logistics scheme of the Loan Department are the principal bottlenecks that severely impair service in terms of turnaround time on discharged books. We are theoretically capable of getting a book discharged and reshelved in one and a half to two hours, utilizing routine (batch) procedures, but we seldom can do this. The toilsome manual sorting of books by tier (which takes place in Fourth Tier Returns), and the ponderously slow intrastack transport (by tubs, trucks, cranky conveyor, and overworked elevators) is inherently inefficient. Special shelving crews at peak periods help some, and proposed stack renovations should facilitate things a little, but the stoop-labor remains, and will remain in the foreseeable future.

The 258 "Tubs On Tier" reports and the 124 "Fourth Tier Returns" reports were requests that originally were reported NOS and NIP. That search turned up about twice as many on the tiers of their assigned location as in the preliminary sorting area is more than likely indicative only of the fact that because of pressures brought about by congested space, books are cleared out of Fourth Tier Returns faster than from the roomier Tubs on Tier positions. There are no data available to correlate the time of discharging with tho time of request and search.

BEST COPY AVAILABLE



LOAN DEPARTMENT SERVICE SUI.VEY-WINTER QUARTER 1969

✓A/On Shelf In Place
○B/Mis-shelved
○C/Tubs on Tier
○D/4th Tier Returns
○E/On Hold Shelf
○F/Out-Same Borrow.
○G/Out-Faculty,
due ____________
○H/Out-Other Borrow.
○J/ILL or Photolab
○K/Catalog - Bind
○L/Missing - RA
○M/RBR, HGS, Sem, Br.
○N/In ICLF(N)
○P/In Another Library

REQUEST: 7 MAR fri

FOUND:

MAILING ADDRESS (PRINT LEGIBLY)

NAME Naomi Rudo

ADDRESS

○1/Report Given Borrower
○2/No Check - No Report
✓3/Call Number Correct
○4/Borr. Error, Corrected
○5/Keypunch Error, Corr.
○6/No Such Book(SL-AT=0)

OTHER:

CALL CARD

CALL NUMBER
QC6
R391
([illegible])

VOLUME

COPY

DATE OF PERIODICAL

AUTHOR
Reichenbach, Hans

TITLE
Copernicus to Einstein

SELECTED PORTIONS OF:

Document Availability and Use Patterns at the University of California, Berkeley Library: A Comparison with California State University, Sacramento

Charles Martell

Institute of Library Research
University of California

Berkeley, California 94720

July 1975

CONTENTS

ABSTRACT i

TABLES ii

FIGURES iv

BACKGROUND AND PURPOSE 1

METHODOLOGY 4

AVAILABILITY STATES 8

  Status of material 8
  Time required to obtain material 12
  Location of material 14

BOOK CLASSIFICATION ALGORITHM 19

DISCUSSION 26

APPENDIX 1 30

APPENDIX 2 31

REFERENCES 32

ABSTRACT

This study examines three key availability characteristics of materials at the University of California, Berkeley library system: status of materials, time required to obtain them, and their location. It then examines these characteristics in light of interlibrary loan criteria set forth in a major report on library cooperation by the Audits Division of the Department of Finance, State of California. Circulation data gathered from the libraries of UC, Berkeley and California State University, Sacramento form the basis for this examination. Approximately 58% of the books sampled at Berkeley were found on the shelves at the time of the first search. Using a classification algorithm developed by the Audits Division it was ascertained that 82% of the books in the sample were high-use (i.e., circulated at least once every four years during their active lives). Following the criteria for resource sharing suggested in the Auditors Report and given the availability of books in the Berkeley collection only 13% of the sampled books would have been available/eligible for interlibrary loan. It is doubtful that a highly dedicated delivery system such as the one recommended in the Auditors Report could be justified on the basis of the results found in this study without a substantial revision of the resource sharing criteria.

BACKGROUND AND PURPOSE

How long will it take to get what I want? This is a question that library users frequently ask. Fast access to or quick delivery of library materials will often create a favorable impression concerning the efficiency of library operations. Dissatisfaction, on the other hand, may result when delays occur (i.e., when the desired item is not immediately available).

Within the California system of higher education the issues of quick delivery and improved access have received support on an interinstitutional basis. In its report, Library Cooperation: A Systems Approach to Interinstitutional Resource Utilization, the Audits Division of the California Department of Finance states that the present system of interinstitutional cooperation encourages a "hit-or-miss" mode of operation which effectively limits library users "to materials held on their own campus."[1] In order to facilitate resource sharing between the University of California (UC) system and the California State University and Colleges (CSUC) system the Auditors Report recommends: "The establishment of a quick and efficient interlibrary loan service designed to provide minimum transaction time to the maximum number of patrons. Interlibrary loan routes, designed around a 'regional center,' should service all participating campuses at least once each weekday."[2] Two regional centers are recommended, one located at UC, Berkeley and serving Northern California and the other located at UCLA and serving Southern California. Operationally, the intent is to make available within a twenty-four hour period library materials located at other UC-

CSUC campuses in the same region (i.e., Northern and Southern California).[3]

There are two major assumptions in the recommendations for "a quick and efficient interlibrary loan service:"

1. an effective twenty-four hour turnaround cycle can be implemented
2. requested books will be available in sufficient numbers to warrant a dedicated delivery system.

Aspects of the first assumption have been reported by this author in Interlibrary Loan Turnaround Time: A Study of Performance Characteristics of the University of California, Berkeley Interlibrary Loan Lending Operations.[4] The present study* addresses the availability component of the second assumption.

The principle question is: how available are the library materials in the Berkeley library collection to interlibrary loan borrowers within the UC and CSUC systems? Three indices of availability are utilized:

1. status of material, e.g., on shelf in expected location
2. time required to obtain material
3. location of material

Data pertaining to these indices are presented in the section entitled "Availability States."

The second part of this study will be devoted to an examination of the Book Classification Algorithm developed by the Audits Division in order "to estimate the proportion of high-circulation, low-circulation items" in a library's collection.[5] This statistic is significant since the Auditors Report recommends that high-use library materials should not be made available to interlibrary loan borrowers.[6] The algorithm will be examined in order to determine the effect its use would have on the first index of availability (i.e., the status of materials).

---

*This study was originally commissioned by Richard Dougherty, University Librarian at Berkeley, in order to collect data concerning the availability of library materials on the Berkeley campus. The data were to be used to provide general information concerning a range of availability characteristics within the Berkeley library system and to help in the process of examining certain assumptions implicit in the Auditors Report.

METHODOLOGY

The sampling technique employed in this study conforms explicitly to the approach used in the Auditors Report for the analysis of use patterns (i.e., high, low and no-use). Replication of the Auditors sampling methods is considered appropriate for several reasons:

1. The high degree of confidence with which the sampling technique describes the population parameters. "The governing sample size was to satisfy the condition that there would be a 95 percent chance of the sample statistics being within 5 percent of the population parameters."[7]
2. Their sampling error and measurement error was less than 1.3 percent.
3. The need for comparability in dealing with the Book Classification Algorithm.
4. The high confidence level and the method of sampling - systematic shelflist sampling - permit use of the same sample for both the tests of availability and the examination of the potential effects of the Book Classification Algorithm on the status of library materials at Sacramento and Berkeley.

A.K. Jain in A Statistical Study of Book Use analyzed various methods for obtaining a "collection sample" - a sample of the total collection of the library and the collecting of information on the past usage of books in the sample.[8] He concluded that for his purposes the shelflist sample was the most effective. Jain was especially interested in the comparability of his results with earlier availability studies by Trueswell[9] and Fussler and Simon.[10] Jain like the Auditors chose a systematic rather than a purely random sample.

The library shelflist at CSU Sacramento is used for the base sample. Sacramento is an obvious choice because: (1) it would be a major beneficiary of the quick delivery system; (2) it was sampled by the Auditors in their test of use patterns based on the algorithm; (3) it is one of the few CSUC campuses in the area to keep permanent circulation records (i.e., date-due slips); and (4) geographic proximity - within 75 miles of Berkeley. The sample size is 600. Only monographs and monographic serials are included in the sample. Random number tables are used for the selection of Sacramento's shelflist drawers.[11]

> "The first time a drawer was selected the fourth card from the front was read. If it was a member of the population (i.e., a circulating item which was not a periodical, thesis, gift, map, phonograph record, or art print), it was included in the sample. If it was not a member of the population, the fifth card was read and the same determination made. This process was continued until a member of the population was selected. The second time a drawer was selected, the fourth card from the rear was used. If a drawer was selected a third time, we would start with the twentieth card from the front, etc."[12]

This is done until 600 items are selected.

Using xeroxed copies of the shelflist cards the Sacramento stacks are searched for books whose call numbers match the individual shelflist cards. Circulation data - "a year-by-year account of the frequency of circulation starting with the year of its first circulation"[13] - are recorded from the date-due slips located in each book. When there is evidence that old date-due slips have been removed and replaced by new slips, the book is automatically listed as high use.[14] The circulation file is then checked for all books not found on the shelf at the time of the first search. If any books still remain unaccounted for, the aid of a library assistant is enlisted in order to search further, e.g., in the bindery file.

After completion of the Sacramento stage of the study the author/title catalog at Berkeley's Doe Library (main graduate library) is checked in order to determine the Berkeley call numbers for the items taken from the Sacramento shelflist. The following information is recorded: (1) whether or not Berkeley owns the book; (2) the call number or numbers for matching books; (3) the call number or numbers for near matches; and (4) the specific location(s) of the book (i.e., Doe Library, Moffitt Library and/or branch libraries). Near matches are earlier or later editions of the items taken from the Sacramento shelflist. For a book to be considered a near match it has to be in the same language and, if special introductions, illustrators or translators are involved, there must be an exact match with these features. Revised editions are not listed as near matches.

Once the call numbers are verified the Doe Library stacks are searched to determine the status of each book and to record the circulation data. In order to locate books not on the shelf, the circulation file, the Richmond storage file and the daily transaction file are checked. If the book is on loan a recall is requested. If the book is in storage it is ordered. Searches are requested for any books still remaining unaccounted for. The next step is to search the branch libraries for (1) those items which are not located in the Doe or Moffitt Libraries and (2) those items which are located in both the Doe Library and the branch libraries but are not found at the time of the first search of the Doe Library. The same search procedures are used in the branch libraries for determining the status and use patterns of the sample. A log is kept of the dates on which recalls, storage items and searches are requested. This allows one to measure the interval between date of request and either notification of status or delivery of item for the purpose of recording circulation data.

Orr has described the role which this researcher assumes as his ideal. Because we were "interested in testing the capability of a library, not the capability of its users, we could simplify matters by assuming that the users to be simulated were reasonably knowledgeable, and that, if an item were properly shelved, they could find it without wasted effort and with only minimal help from library staff. The simulation, however, should not assume any special knowledge of the particular library being tested, other than what could be learned from its public catalog and from other 'location' tools normally available to users."[15]

This study was conducted within the UC Berkeley and CSU Sacramento library systems during August and September 1973. As of June 30, 1972 Sacramento had library holdings of 412,358 volumes and Berkeley had 3,791,610 volumes.[16]

AVAILABILITY STATES

This section presents the results of the sampling and measurement of three indices of availability: status of material, time required to obtain material and location of material.

Status of material:

The status of materials for Sacramento at the time of the search was as follows:

TABLE 1: Status of Materials - Sacramento

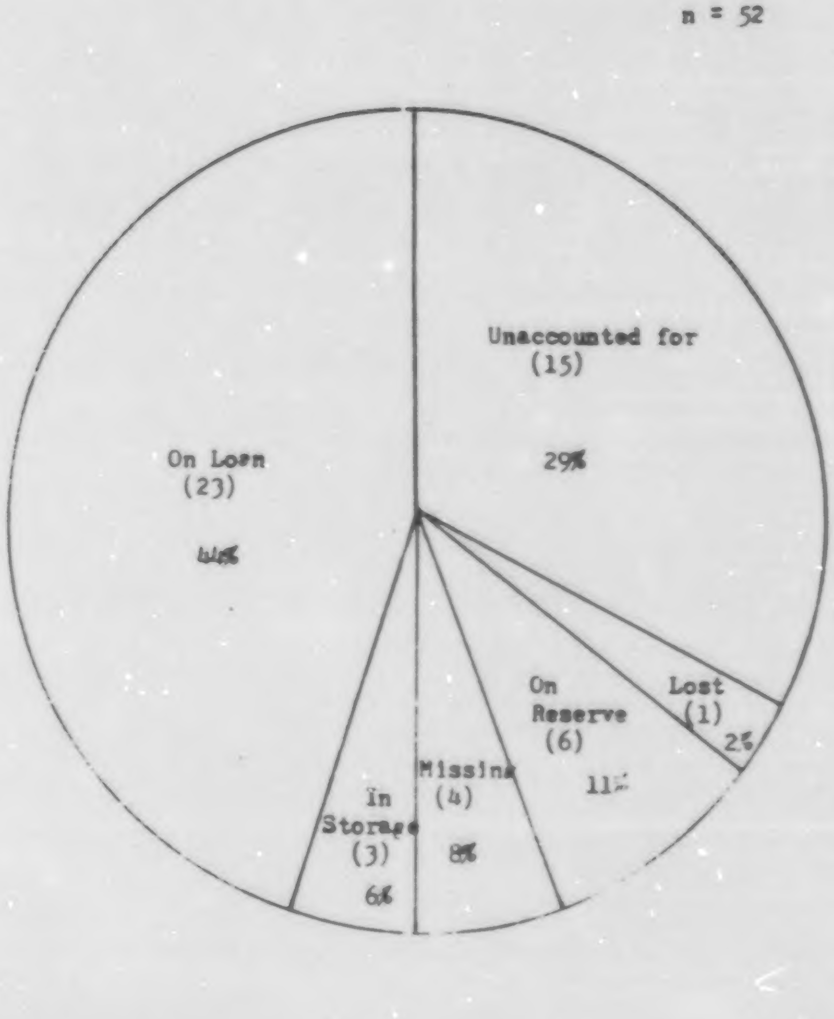
	Number	Percent
Found on the shelf	548	91
Otherwise accounted for	37	5
Unaccounted for	15	4
Total	600	100

Figure 1 gives a breakdown of those books not found on the shelf (i.e., otherwise accounted for and unaccounted for). Approximately one month after the Sacramento stacks had been searched the author received a final status report on the "unaccounted for" category from the Circulation Department staff. The status report indicated that of the 15 "unaccounted for" items:

1. 5 books had been withdrawn from the collection;
2. 2 books had been located;
3. 2 books were in the Processing Department; and
4. 6 books remained unaccounted for.

The 6 books still unaccounted for represent 1% of the total sample (n = 600).

FIGURE 1: Breakdown by Specific Category of Those Books Not Found on the Shelf at Sacramento



REFERENCES

1. *Library Cooperation: A Systems Approach to Interinstitutional Resource Utilization*. Program Review Branch, Audits Division, Department of Finance, State of California. June 1973 (Report No. PR-70).
2. *Library Cooperation*, p. 59
3. *Library Cooperation: A Systems Approach to Interinstitutional Resource Utilization* (Draft). Program Review Branch, Audits Division, Department of Finance, State of California. November 30, 1972.
4. Martell, Charles. *Interlibrary loan turnaround time: a study of performance characteristics of the University of California, Berkeley interlibrary loan lending operations*. Institute of Library Research. University of California, Berkeley. January 1975.
5. *Library Cooperation*, p. 28.
6. *Library Cooperation*, p. 62.
7. *Library Cooperation*, p. 23
8. Jain, A.K., et al. *A Statistical Study of Book Use*. Lafayette, Indiana: Purdue University, 1967. ERIC PB 176525.
9. Trueswell, R.W. "A Quantitative Measure of User Circulation Requirements and its Possible Effect on Stack Thinning and Multiple Copy Determination." *American Documentation* 16 (1965): 20-25.
10. Fussler, H.H. and Simon, J.L. *Patterns in the Use of Books in Large Research Libraries*. Chicago, Ill.: University of Chicago Library, 1961.
11. *A Million Random Digits With 100,000 Normal Deviates*. Rand Corporation. New York: Free Press, 1955.
12. *Library Cooperation*, p. 25.
13. *Library Cooperation*, p. 25.
14. This procedure is deemed appropriate since there is an extremely low probability (given the Auditors algorithm) that any book with a full date-due slip would not qualify as high-use (i.e., circulate at least once every four years during its active life).

15. Orr, Richard H.; Pings, Vern M.; and others. "Development of Methodologic Tools for Planning and Managing Library Services: II. Measuring a Library's Capability for Providing Documents." *Bulletin of the Medical Library Association* 56 (1968): 241-267. p. 245.

16. *CU NEWS* Berkeley, California. General Library University of California. June 30, 1972. Library holdings for Sacramento are taken from *Library Cooperation*, p. x.

17. Martell, p. 15.

18. *Library Cooperation* (Draft), p. 13.

19. Nozik, Barbara. *The Use Status of Books Requested from the University of California, Berkeley Inter-Library Loan*. Institute of Library Research. University of California, Berkeley. March 1974. Abstract.

20. Thompson, Donald. "An analysis of circulation patterns at Sonoma State College and the University of California, Berkeley, with suggestions for more effective interinstitutional cooperation." Design Seminar Research Report. University of California, Berkeley. June 1973. p.30.

21. Thompson, p. 30.

22. *Library Cooperation*, p. 13.

23. *Library Cooperation*, p. 39.

24. Thompson, p. 11.

25. *Library Cooperation* (Draft), p. 32.

26. Martell, p. 22.

27. Jain, p. 194.

28. Meier, Richard L. "Information input overload: features of growth in communication-oriented institutions." *Libri* 13 (1963): 1-44.

29. Burnett, A.D. "Reader Failure: A Pilot Survey." *Research in Librarianship* Vol. 1, 1966. p. 147.

30. Meier, p. 27.

31. The Auditors note that in their study utilizing the algorithm: "Circulation studies . . . at three campuses indicate that . . . 55 percent of the UC collection circulates less than once every four years during the active lives of these materials" (i.e., 55 percent are low and no-use). Although Berkeley was not among the three campuses studied (Irvine, Santa Barbara and UCLA) its holdings would be more comparable to the collections on the UC campuses than to Sacramento's. Library Cooperation, p. xiv.

32. Urquhart, J.A. and Schofield, J.L. "Measuring Readers' Failure at the Shelf." Journal of Documentation (December 1971): 273-286. p. 276.

33. Library Cooperation (Draft).

34. Library Cooperation, p. 34.

RECENT ILR PUBLICATIONS

Publication of papers and reports of interest to scholars and practitioners in the field of library and information science is an important function of the Institute of Library Research. In addition to this study, the following have been published recently by ILR:

ILR-73-001 Todd, Judy, Summary Report of Student Studies of the Subject Headings Used in the University of California, Berkeley Subject Catalog (July 1973) 8 pp. (ERIC No. ED-082 775)

ILR-73-002 Bourne, Charles P., and Jo Robinson, SDI Citation Checking as a Measure of the Performance of Library Document Delivery Systems (July 1973) 10 pp. (ERIC No. ED-082 774)

ILR-73-003 Weeks, Kenneth, Determination of Pre-Acquisition Predictors of Book Use: Final Report (July 1973) 20 pp. (ERIC No. ED-082 776)

ILR-74-004 Weeks, Kenneth, Proposal for a University of California/California State University and Colleges Inter-Segmental Machine Readable Library Patron Card (August 1973) 21 pp. (ERIC No. ED-082 777)

ILR-73-005 LeDonne, Marjorie, "Summary of Court Decisions Relating to the Provision of Library Services in Correctional Institutions," Association of Hospital and Institution Libraries Quarterly (Winter/Spring 1973) 9 pp.

ILR-73-006 Thelin, John, and Bonnie F. Shaw, (editors), Institute of Library Research Annual Report: July 1972 to June 1973 (September 1973) 30 pp. (ERIC No. ED-086 169)

ILR-73-007 Dekleva, Borut, Uniform Slavic Transliteration Alphabet (USTA) (October 1973) 82 pp. (ERIC No. ED-086 164)

ILR-73-008 LeDonne, Marjorie, Findings and Recommendations. Volume I, Survey of Library and Information Problems in Correctional Institutions (January 1974) 88 pp. (ERIC No. ED-095 842)

ILR-73-009 LeDonne, Marjorie, Access to Legal Reference Materials in Correctional Institutions. Volume II, Survey of Library and Information Problems in Correctional Institutions (January 1974) 89 pp. (ERIC No. ED-095 843)

ILR-73-010 LeDonne, Marjorie, David Christiano, and Jane Scantlebury, Current Practices in Correctional Library Services: State Profiles. Volume III, Survey of Library and Information Problems in Correctional Institutions (January 1974) 68 pp. (ERIC No. ED-095 844)

ILR-73-011 LeDonne, Marjorie, David Christiano, and Joan Stout, Bibliography. Volume IV, Survey of Library and Information Problems in Correctional Institutions (January 1974) 28 pp. (ERIC No. ED-095 845)

ILR-73-012 Gregor, Dorothy, Feasibility of Cooperative Collecting of Exotic Foreign Language Serial Titles among Health Sciences Libraries in California (February 1974) 44 pp.

ILR-74-001 Nozik, Barbara, The Use Status of Books Requested from the University of California, Berkeley, Inter-Library Loan (March 1974) 11 pp.

ILR-74-002 Bourne, Charles P., Institute of Library Research Annual Report: July 1973 to June 1974 (1974) 25 pp. (ERIC No. ED-097 884)

ILR-74-003 Humphrey, Allan J., Survey of Selected Installations Actively Searching the ERIC Magnetic Tape Data Base in Batch Mode Volume I (June 1973) 86 pp. (ERIC No. ED-096 982) [Volume II (June 1973) 268 pp. (ERIC No. ED-096 983)]

ILR-74-004 Cooper, William S., Donald T. Thompson, and Kenneth R. Weeks, The Duplication of Monograph Holdings in the University of California Library System (October 1974) 32 pp. (ERIC No. ED-097 883)

ILR-74-005 Bourne, Charles P., Jo Robinson, and Judy Todd, Analysis of ERIC On-Line File Searching Procedures and Guidelines for Searching (November 1974) 140 pp. + appendices. (ERIC No. ED-101 757)

ILR-75-001 Martell, Charles R., Jr., Interlibrary Loan Turnaround Time: A Study of Performance Characteristics of the University of California, Berkeley Interlibrary Loan Lending Operation (January 1975) 34 pp.

ILR-75-002 Bourne, Charles P., and Dorothy Gregor, Methodology and Background Information to Assist the Planning of Serials Cancellations and Cooperative Serials Collection in the Health Sciences (January 1975) 60 pp.

ILR-75-003 Bourne, Charles P., Dale Reed, and Margaret Buss, Bibliographic Access to the University of California Library Resources at Berkeley and Los Angeles [forthcoming]

A Brief Investigation of the Availability of Books in the Firestone Library Open Stacks
Princeton University Library I.A. User Studies and Library Program Studies

There is a recent and growing concern among librarians throughout the country about "availability," or the actual presence, on the shelf, of the book the user is seeking. One librarian in the Midwest estimated optimistically that no more than 25% of the collection would be unavailable. His survey found that actually from 40-50% of the books were unavailable, or not on the shelf. Other libraries report similar experiences and figures.

Princeton decided to undertake a sample survery to see how many books, out of 400 selected randomly, would be on the shelf. The most heavily-used portions of the collections in the Firestone Library are seen to be history, economics, and language and literature, so, for this experiment, it was decided to restrict the sample to these areas. (The methodology for deriving the sample is attached as Appendix I. The sample was drawn from a catalogue of cards representing the books as they stand on the shelf, one card per book.)

Various statistics describing the results of the survey are presented in Table I. Specifically, Princeton's availability rate is very high; in the survey only 7.5% of the sample, or 30 books, were not on the shelf. Of those 30, 15 were charged out,in the routine fashion, to specific users and were readily located by checking the circulation records. (Six books were out to faculty members, five to graduate student carrels, one to a senior carrel, one on regular loan to a student, one on reserve, and one out to another library on interlibrary loan.) 92.5% of the sample were on the shelf; 96.2% of the sample were easily located. Very few libraries have such high availability rates for their collections.

The remaining 15 books were "traced," using a standard procedure. (When a student is unable to find the item she/he seeks, he fills out a "trace" slip and submits it to the Circulation Department.) Within days the tracing unit identified the status of each item: four books were located, having been temporarily off the shelf when the sample was taken, and eleven books were recorded as missing. Of the 11, only two title were not previously known to be missing; the others had been identified as missing or lost in various inventories in past years.

Replacement of missing and lost materials had, as a library policy, been delayed in order to determine that the book did not reappear within a reasonable period. The policy is now being changed to insure timely replacement of items, indeed immediate action will result when two people request the same missing book.

There are, however, several questions not answered by the survey. Are the students finding, on the shelves, the books they really want (not 400 titles picked at random)? Does the library have any or enough duplicate copies of the most heavily used books? How many times a year does an item circulate? How can the Library use circulation data to provide more access to its resources? These questions can occupy Princeton's attention in the coming years, and the answers can help to provide even better service to the University community.

Judy H. Fair

Judy H. Fair
CLR Intern
4-18-75

TABLE 1

	HISTORY ("1000" numbers)	LANGUAGE AND LITERATURE ("3000" numbers)	ECONOMICS ("H")	TOTALS
NOT ON SHELF				
IN CIRCULATION	2	5	2	9
IN CARREL	3	1	2	6
"TRACED"	3 (2.26%)	9 (5.03%)	3 (3.41%)	15 (3.75%)
ON THE SHELF	125 (94%)	164 (91.6%)	81 (92%)	370 (92.5%)
TOTAL	133	179	88	400

A Brief Investigation of the Availability of Books in the Firestone Library Open Stacks--Table 1.

4

Princeton University: DEPARTMENT

INTER-OFFICE CORRESPONDENCE

To MR. DIX

DATE 12-26-74

SUBJECT SAMPLING METHOD TO BE USED IN "AVAILABILITY" STUDY

FROM JUDY FAIR Judy

DRAWERS FOR HISTORY, ECONOMICS, LANGUAGE & LITERATURE (HEAVILY USED MATERIAL IN FIRESTONE LIBRARY.)

662.3 DRAWERS

2. AN AVERAGE OF 10 INCHES PER DRAWER (BASED ON ACTUAL MEASUREMENT OF 203 DRAWERS)

3. AN AVERAGE OF 85 CARDS PER INCH.

4. 662.3 × 10 × 85 = 562,955 TOTAL CARDS

5. 400 SAMPLE CARDS WANTED

6. 400 DIVIDED INTO 562,955 = 1407.3 CARDS OR 16.6 INCHES (1407.3/85)

7. THE SAMPLE CARDS WILL BE TAKEN AT INTERVALS OF 16.6 INCHES.

Method approved by Prof. Bloomfield, 12.27.

WSD

Princeton University: DEPARTMENT

To MR. DIX

DATE 12-26-74

SUBJECT SAMPLING METHOD TO BE USED IN "AVAILABILITY" STUDY

FROM JUDY FAIR

---

1. DRAWERS FOR HISTORY, ECONOMICS, LANGUAGE & LITERATURE ([illegible] MATERIAL IN FIRESTONE LIBRARY.)

   662.3 DRAWERS

2. AN AVERAGE OF 10 INCHES PER DRAWER (BASED ON ACTUAL MEASUREMENTS OF 20.3 DRAWERS)

3. AN AVERAGE OF 85 CARDS PER INCH.

4. 662.3 x 10 x 85 = 562,955 TOTAL CARDS.

5. 400 SAMPLE CARDS WANTED

6. 400 DIVIDED INTO 562,955 = 1407.3 CARDS OR 16.6 INCHES (1407.3/85)

7. THE SAMPLE CARDS WILL BE TAKEN AT INTERVALS OF 16.6 [illegible]

INTER-OFFICE CORRESPONDENCE

AVAILABILITY WORKSHEET PRINCETON UNIVERSITY LIBRARY

uthor's full name: Denis de Rivoyre, Barthélemy Louis
hort title: Les Français à Obock
all numbers: 1829.293 (1887)
ol. number:
(vol. I or first vol. owned)
ll copy numbers:
Any notations on shelf list:

SAMPLE

heck Public Catalog: On Reserve: In Annex:
Date of shelf check: 1/23/75 On shelf: ✓
In Circulation: Date Due: In Carrel:
Status of Borrower:
Number of circ. transactions on card: 0

race requested: Date:
Trace report:
In circulation:
At bindery:
Shall we reserve:
Information incorrect. Please recheck:
Missing. If still needed see Reference Librarian:
On Reserve:

OT ALL OF THESE
E APPLICABLE)

AVAILABILITY WORKSHEET

uthor's full name: Seitz, Stefan
hort title: Die Töpfer-Twa in Rwanda
all number: 1849.851 (1970)
ol. number:
(vol. I or first vol. owned)
ll copy numbers:
ny notations on shelf list:

heck public catalog: On Reserve: In Annex:
Date of shelf check: 1/23/75 On shelf: ✓
n Circulation: Date Due: In Carrel:
Status of Borrower:
Number of circ. transactions on card: 0 (cd 74)

race requested: Date:
Trace report:
In circulation:
At bindery:
Shall we reserve:
Information incorrect. Please recheck:
Missing. If still needed see Reference Librarian:
On Reserve:

(NOT ALL OF THESE
ARE APPLICABLE)

SELECTED PORTIONS OF
CIRCULATION OF MATERIALS FROM
PURDUE UNIVERSITY LIBRARIES
by Miriam A. Drake RDU 75-06 Sept. 1975

TABLE OF CONTENTS

LIST OF TABLES ii

INTRODUCTION 1

METHODOLOGY 2

FINDINGS 5

ALLOCATION METHODS 9

RECOMMENDATIONS 12

INTRODUCTION

In March 1974, the Research Development Unit (RDU) began a cost allocation study of the Purdue Libraries and Audio-Visual Center. The objectives of the study are to: 1) ascertain the costs of providing library and audio-visual services and materials to the West Lafayette campus; 2) allocate costs by user group and academic department; and 3) allocate costs by library function. The second objective, allocation of library costs by user group, is the subject of this report. A final report for the entire study will be issued later in the year. Allocation data for the Audio-Visual Center will be included in the final report.

Before library costs could be allocated by user group and academic department it was necessary to determine the users of the Purdue Libraries. Data on user identification was not readily available; therefore, a circulation survey was undertaken. The survey was conducted during the busiest three months of second semester, February 1 through April 30, 1975.

METHODOLOGY

Since Purdue's library circulation systems are manual it was not feasible to include every library transaction in the survey. Individuals collecting data were asked to include materials borrowed for overnight or longer in the sample. In addition, libraries which offer photocopy service were asked to report their photocopy activity for the sample period. In-library use of materials, Bookstall, and reserve materials were excluded from the study due to the difficulty and expense of data collection. It is assumed that reserve book usage is highest among people involved with courses for which the books are reserved. It has been suggested that over-the-counter circulation counts are poor indicators of library usage. One study has shown that there is a high positive correlation between books used inside and outside the library. McGrath, in his study, concluded that total library usage could be estimated from over-the-counter loan records for both subjects used and department of borrower.*

---

*William E. McGrath. "Correlating the Subjects of Books Taken Out of and Books Used Within an Open-Stack Library." College and Research Libraries, July 1971.

Two libraries, General and Krannert, use a multi-part key sort transaction card for library loans. Copies of transaction cards were sent to the Research Development Unit after materials were returned to the library. The sample period for these libraries was extended one week in order to gather data on semester loans and other materials which were charged out before April 30 but returned before May 6.

Other Purdue libraries use a book card, on which the borrower signs his/her name, for circulation control. Duplication of these cards was precluded by time, convenience, and expense. In addition, book cards generally do not contain sufficient data to fully identify the borrower. Special forms and imprinters to be used for data collection were issued to libraries using book cards. These forms, which were precoded for location, were sent to the Research Development Unit weekly during the study.

All libraries were instructed to ask every borrower for a passport (if Purdue student) or other means of identification, such as staff card, bursar's receipt, etc. All passports were imprinted on forms. Borrowers associated with Purdue but not in possession of a passport, were asked to present other identification and to give their status (faculty, student, staff) and department. These data were recorded on transaction cards or forms. There were two classes of borrowers not associated with Purdue; general public and interlibrary loan users. Public borrowers using the libraries were classified as "other". Interlibrary loans were classified separately by library location.

Identification of borrowers at each location was the prime purpose of the circulation survey; however, questions had been raised regarding the subject areas of materials borrowed by different groups from specific libraries. For example, it would be of interest to know how many Industrial Engineering students were using the Mathematical Sciences library for books on statistics. In order to answer these questions, libraries were asked to record the Dewey class number up to two places beyond the decimal point on forms to be included in the sample.

When forms were received by RDU a notation was made on a master control list to indicate that forms had been received for the specific library and week. In addition, each packet of forms was given a batch number which was used to maintain control between RDU and keypunching. Forms were examined for errors, presence of social security number or other means of identifying the borrower and presence of Dewey class numbers. After editing, forms were sent to keypunching.

The completed punched cards were sent to the Administrative Data Processing Center for processing. Social security numbers, which were punched from passport data, were matched against files from the Registrar's Office and Personnel Office to determine the status and department of the borrower. When a match could not be made, the transaction was labeled "error" and excluded from the final tabulation. All records containing social security number in RDU's files were destroyed to protect the privacy of individuals. Data were summed by level, department, and library location.

FINDINGS

The survey sample includes 100,240 items loaned directly from 23 libraries and 4361 photocopied items made by 8 libraries. The General library circulated 48.6% of the items in the sample (Table 1). It was believed that this figure was somewhat inflated because items which are part of school and departmental collections are stored in the attic of the General library and the 9th Street Warehouse and are charged out through the General library. Statistics maintained by the circulation staff indicate that approximately 85 items, less than 1% of General's total for the period, circulated from the General library were items from school and departmental collections.

Circulation in the school and departmental libraries ranged by 6460 items (6.2%) in the Krannert library to 63 items (.1%) in the Agricultural Engineering library. There were 13 libraries with less than 2000 items circulated. This group includes 4 egineering libraries which are scheduled for consolidation and 4 libraries associated with the School of Agriculture. The latter 4 libraries together circulated 2768 items during the survey period. Photocopies provided by Biochemistry represented 18% of the total circulation of the 4 libraries and 52% of the loans made from the Biochemistry library.

Undergraduates charged out the greatest number of items while graduate students received the greatest number of photocopies (Table 2). The

General library loaned the greatest proportion of items to each group on the campus (Tables 3 and 3A). Libraries receiving greatest use by faculty were General (38.1%), Chemistry (8.8%), Mathematical Sciences (8.8%), and Krannert (7.7%). The patterns of library use were similar for graduate students except that they used the Psychology library more heavily than the faculty. Undergraduates used General (62.2%), Home Economics (7.5%), and Life Science (5.2%) most heavily.

Interlibrary loans during the sample period were more evenly distributed throughout the system. Lending was greatest from General (19.0%), Life Science (13.4%), Pharmacy (12.0%), and Veterinary Medicine (11.3%). This distribution is not surprising in view of the specialized nature of these collections and their uniqueness in the State.

Purdue students and faculty borrowed 87.1% of items included in the sample (Table 4). Usage by School ranks as follows:

1.	Humanities, Social Science, and Education	33.0%
2.	Science	15.6%
3.	Engineering	11.8%
4.	Agriculture	8.2%
5.	Home Economics	7.7%
6.	Industrial Administration	5.3%
7.	Technology	2.6%
8.	Pharmacy	2.1%
9.	Veterinary Medicine	.8%

Circulation by school provides only a gross indication of usage among different disciplines and users. More meaningful information can be derived by combining circulation and population data to produce per capita usage and distributions of usage compared to population (Tables 5.1, 5.2, 5A.1, 5A.2, 6.1 and 6.2). The figures below were calculated on the basis of head count data provided by the Registrar's Office for second semester and the University Personnel Office.

Per Capita Loans by School

School	Faculty		Graduate Student		Undergraduate	
	Per Capita Loans	Rank	Per Capita Loans	Rank	Per Capita Loans	Rank
Agriculture	3.2	7	5.2	9	1.6	4
Engineering	4.6	5	6.5	7	1.3	6
Home Economics	3.0	8	10.0	1	3.5	2
Humanities, Social Science & Education	7.1	2	8.5	5	3.9	1
Industrial Admin.	5.1	4	5.7	8	1.4	5
Pharmacy	5.5	3	9.0	4	.9	8
Science	7.3	1	8.4	6	2.2	3
Technology	1.0	9	9.5	3	1.3	7
Veterinary Medicine	3.8	6	9.9	2	0	9
Total	5.2	-	7.7	-	2.1	-

Per capita loans to faculty were greatest in Science; Humanities, Social Sciences, and Education (HSSE); and Pharmacy. Graduate student use was greatest in Home Economics, Veterinary Medicine, and Technology, with HSSE ranking fifth. Undergraduate use was greatest in HSSE, Home Economics, and Science. Library usage in relation to population can be seen by comparing the percentage distribution of loans and population for each population group. Tables 5A.1 and 5A.2 show the percentage distribution for schools and department.

Distribution of Library Loans and
Population Groups--West Lafayette Campus

School	Faculty		Graduate Student		Undergraduate	
	% of Population	% of Loans	% of Population	% of Loans	% of Population	% of Loans
Agriculture	19.9	12.3	9.5	6.4	15.0	11.4
Engineering	16.1	14.1	18.2	15.4	19.9	11.7
Home Economics	3.8	2.2	4.4	5.7	7.9	13.1
Humanities, Social Science & Education	25.0	34.3	36.7	40.6	19.7	36.4
Industrial Administration	3.7	3.6	7.6	5.6	11.1	7.2
Pharmacy	3.7	3.9	2.8	3.3	3.3	1.3
Science	18.6	26.0	18.7	20.3	13.5	13.8
Technology	5.8	1.1	.9	1.1	8.3	5.1
Veterinary Medicine	3.4	2.5	1.2	1.6	1.3	0
Total	100.0	100.0	100.0	100.0	100.0	100.0

ALLOCATION METHODS

The cost study will utilize two methods to allocate library costs. The first method will divide library costs into two general categories; processing and service. Processing costs are all costs associated with the purchase decision, order, receipt, classification, cataloging, and marking of materials. Under this technique, the cost and number of materials purchased are determined for each department fund. The processing cost is then divided among the departments on a unit basis.

$$P_i = M_i + T_i$$

where P_i = total processing and material cost for any department

M_i = cost of materials for the department

T_i = processing costs

$$T_i = \frac{A_i}{A}(C_1) + \frac{D_i}{D}(C_2)$$

where A_i = number of items purchased for the department

A = total number of items purchased

C_1 = acquisitions costs

D_i = number of items cataloged for the department

D = total number of items cataloged

C_2 = cost of cataloging, classification, marking, etc.

Acquisitions and cataloging costs will be further subdivided into serials and monographs.

The costs of providing service to library users is not expected to be uniform throughout the system. Service costs which are allocated to user groups will vary among libraries in proportion to space, equipment, staffing, etc. The cost of operating public facilities, reference, circulation and other services is determined and allocated on the basis of recorded circulation. In order to determine average costs for library system services to a department the following formula will be used:

$$S_i = \frac{X_i}{X}(Y)$$

where S_i = service cost for a department

X_i = number of loans by faculty and students in the department

X = total number of loans

Y = total service costs

This formula does not account for the differences in operating costs among the school and departmental libraries; therefore, a separate allocation will be made for each department's use of each library location. These costs will be summed to show the total cost of providing services to each department.

$$S_1 = \frac{u_{1.1}}{U_1}(L_1) + \frac{u_{1.2}}{U_2}(L_2) + \ldots \frac{u_{1.23}}{U_{23}}(L_{23})$$

where S_1 = cost of providing service to one department

$u_{1.1}$ = number of loans to users in one department from library 1

U_1 = total loans from library 1

L_1 = operating costs of library 1

$u_{1.2}$ = number of loans to users in one department from library 2

U_2 = total loans in library 2

L_2 = operating cost of library 2

The two elements of processing and service are combined to give a total cost for providing materials and service to a department

$$L_i = T_i + S_i \text{ or } L_i = T_i + S_1$$

where L_i = total costs of library service to a department

The second allocation method combines all costs associated with the libraries and attributes them to departments on the basis of usage. The gross allocation percentages are in the last column of Table 4. After costs have been attributed to specific departments both techniques further subdivide costs on the basis of usage by level. For example, if the total cost of operating the libraries were $1,000,000, 5.3% or $53,000 would be attributed to the School of Industrial Administration. This cost would be further attributed as follows:

Faculty	6.6%	$ 3,498
Graduate Students	37.8%	20,034
Undergraduates	55.6%	39,468
Total	100.0%	$53,000

The allocation of faculty usage to instructional programs will be made by the Office of Analytic Studies.

RECOMMENDATIONS

The circulation study has fulfilled its primary objective of providing data on which to base the allocation of library costs. The basic data has been preserved on magnetic tape providing a data base for further analysis.

Each departmental or school librarian has received a printout showing usage of appropriate libraries and departments. These data need further analysis to show travel patterns by borrowers on the campus. It is suggested that Industrial Engineering students be invited to analyze the data from a logistics point of view. This type of study could yield information which could be used in future considerations of new facilities or combined collections.

Further consideration should be given to consolidation of collections from which circulation is small. For example, small collections in Agriculture, such as Forestry-Horticulture, Entomology, Biochemistry, and Agricultural Engineering are maintained in four separate facilities. Each library circulates a small number of items.

Additional study should be given to the use of materials in special subject areas. The circulation study indicated that libraries such as Mathematics and Psychology, are serving substantial number of students and faculty from outside their home departments. The Dewey class numbers of materials used by outsiders should be analyzed to determine their general subject areas, and the extent of use by the home department and outsiders. Duplication of heavily used items through departmental or other funding should be considered where appropriate.

There are two important circulation data needs which were not satisfied by this study. The first need is the determination of the number of individual users relative to the population. At present, there is no convenient method of estimating the number of individual faculty members or students who actually use the library and the number who do not use the library. This data would be useful in planning future library services.

The second information need relates to the distribution of loans of material in each location. Specifically, a study should be undertaken to determine the number of books and journals which actually circulate, the number of times each piece is loaned and the proportion of each collection which is seldom or never used. This data would provide the basis for weeding collections and facilities planning.

UNIVERSITY OF CALIFORNIA-
LOS ANGELES

SELECTED PORTIONS OF:

WORKING GROUP ON PUBLIC CATALOGS

SUBGROUP C REPORT

Contents:

Preface and Acknowledgements

I. Literature Search

II. Interviews
  A. Unit Interviews
  B. Interviews with Staff and Faculty Authorities

III. User Surveys
  Appendix A: The Reference Survey
  Appendix B: The Task Force Card Catalog Project Reports
  Appendix C: The Task Force User Questionnaire

IV. Summary of Findings

V. Recommendations

Subgroup C

Jean Aroeste
Diane Kennedy (until April 1, 1974)
James Mink
Roberta Nixon
Frances Zeitlin

WORKING GROUP ON PUBLIC CATALOGS

Report of Subgroup C: User Requirements

Subgroup C was assigned the task of studying the behavior and problems of users of library catalogs in general and within the UCLA Library system in particular. The Subgroup's activities included:

I. Literature search and abstracting of catalog use surveys and other articles dealing with the various aspects of catalog use.

II. Personal interviews with heads and other representatives of Library units to obtain information about problems encountered in the use of public catalogs by the units' readers and staff.

III. Personal interviews with selected faculty and staff authorities.

IV. A test user survey conducted by the Task Force in the URL.

V. A survey of catalog-related assistance provided by the URL Reference staff.

Use was also made of supporting data obtained from Circulation Department statistics and from reports of the Task Force public catalog project of 1973/74.

Subgroup C wishes to thank the fifty or more staff members who so generously contributed time and thought to the unit interviews; the URL Reference staff and the Task Force staff; members of Subgroup B who called to our attention various items in the literature; Edith M. Fuller, who provided pertinent data on interlibrary loan requests; Eleanore Friedgood, Charles Gullans and Seymour Lubetsky; and Carol Petrovsky, who tracked down items identified in the literature search.

I. Literature Search

Contents

A. Approach to the Literature

B. History of Catalog Use Surveys and the Major Surveys

C. Methodology of Catalog Use Surveys

D. Who Uses the Catalog?

E. The Subject Search

F. Form of the Catalog

  1. Book versus Card

  2. Dictionary versus Divided

G. Summaries

  1. Summary of Conclusions

    a. Conclusions on which there is General Agreement

    b. Conclusions on which there is Disagreement

  2. Summary of Recommendations

    a. Recommendations for Improving Catalogs

    b. Recommendations for further Research

H. General Observations

I. Bibliography

A. APPROACH TO THE LITERATURE

Within the large body of literature dealing with theories and problems of the use of the library catalog, Subgroup C tried as far a possible to confine its study to surveys based on data secured directly or indirectly from catalog users. The exact number of such surveys has never been precisely determined. In his comprehensive review of catalog use studies Krikelas (29)* identified fifty-four from 1931 to 1970, reported in more than sixty articles, papers, theses, dissertations, and books. We selected twenty of these reports for careful study, plus seven not included by Krikelas and an additional eight published after 1970. We also studied a number of works on the theory of catalog use and the methodology of user surveys.

Citations to the literature were gathered from two published bibliographies of user studies (16,17), from bibliographies in books and articles, from listings in Library Literature, and from shelf examination of current library periodicals. To make sure that significant items had not been missed, we relied on the resumes of Krikelas and Frarey (24).

Because of the nature of the subject, we did not limit our reading to works published within the last ten years, but our study of the period before 1964 was confined to materials of particular importance. We tried to cover all relevant surveys published since 1966. Our reading was restricted to works dealing with British and American libraries and, for the most part, academic and large research libraries.

The general search for the literature was conducted by one member of the subgroup, who reviewed the materials and selected those considered important enough for study. The materials so selected were distributed among all the members of the subgroup for reading and abstracting. Findings were then compared for areas of agreement and disagreement, important or interesting observations and conclusions, and indications of areas in which further study was needed.

B. HISTORY OF CATALOG USE SURVEYS AND THE MAJOR SURVEYS

Before 1931, the perennial discussion of the library catalog--its philosophy, its problems, its costs--had indicated some concern for the user, but without passing beyond the stage of general impressions and theories. Susan Akers' pioneering article of 1931, entitled "To What Extent do the Students of the Liberal-Arts Colleges Use the Bibliographic Items Given on the Catalogue Card?" (1) was the first effort to make an objective evaluation of catalog use and users. It was motivated by the idea that "to make a good catalogue it is necessary to know the needs of the users of that catalogue." Further studies should explore the possibility that "there may well be as many different kinds of catalogues as there are types of libraries and types of users."

Akers attempted to discover what items on catalog cards were used, how well they were understood, and what additional items might be found useful. Checklists were sent to librarians of ten liberal arts colleges, to be distributed by each to thirty students who were frequent users of the catalog. The lists were checked by 257 students. Questions covered types of entry, bibliographical items such as date, publisher, series, etc., and abbreviations such as "rev. ed.", "tr.", "illus.", etc. Students were requested to suggest other types of information that would be useful on a catalog card.

Findings of the survey indicated that the students did not know how to use the catalog, and did not know about other bibliographical aids. The most frequently suggested type of additional information was the provision of more information about the nature and contents of the book, and the nationality and school of thought of the author. Less use of abbreviations and greater clarity of terminology were strongly indicated. Akers concluded that "either the catalogue must be made self-explanatory or there must be a better system of instructing students in its use than now exists."

Between the Akers survey of 1931 and the publication of the far-reaching American Library Association survey in 1958 thirty-two catalog use surveys of various sizes and structures were produced. Attempts were make to discover who uses the catalog, for what purpose, with what approach, and with what success. A fair amount of consensus developed on a number of points:

a) The library patron makes relatively little use of the catalog.

b) The typical user is a student, more often male than female, who is looking for material to complete a class assignment.

c) The non-specialist makes more use of the subject heading than the specialist.

d) Most use of the subject catalog is for materials in English of fairly recent date.

e) The items of information on catalog cards most used are: author, title, subject heading, date of publication, and call-number. (There is some disagreement on the order of importance of the five items).

f) The rate of success in using the catalog is high.

g) Librarians have not done an effective job in teaching the use of the catalog.

Considerable disagreement had already developed regarding what is now called the "known-item" search versus the subject search. (A "known item" is a document known or believed to exist, about which the user has some information). Most surveys found their use to be about equal, and this finding was reported by Frarey (24) as a generally accepted conclusion. However, indications that the percentage of known-item searches increases proportionately as the academic level of the user rises had already been noted (12,38,39,50).

Disagreement had also developed regarding the value of items of information on the catalog other than the leading five. Akers, Miller (40), Spalding (50) pointed out that different kinds of users had different needs, and different kinds of libraries needed different standards. Arbitrary elimination of certain types of information, or added entries, would cause hardship to many users.

A number of studies indicated the lack of perseverance of most catalog users, and their tendency to give up after meeting with failure after one or two attempts to find information in the catalog.

American Library Association Survey, 1955-56.

This monumental survey, known as the Jackson study (2) and published in 1958, was conducted by interviews based on questionnaires with 5,700 patrons in thirty-nine libraries throughout the United States, ranging from academic, public and special to small high school libraries. Its purposes were:

a) To identify the demands made on the catalog by its users;

b) To measure the adequacy with which the catalog is meeting these demands;

c) To isolate areas in need of more thorough investigation;

d) To provide a more reliable interview form and related tools.

The following findings were reported:

a) All catalogs tested were used successfully and apparently to the patron's satisfaction in the large majority of cases;

b) Many cases of failure were due to the incorrect or incomplete bibliographical data with which the patron had approached the catalog;

c) The patron's inexperience and unfamiliarity with the catalog was a principal source of difficulty;

d) Not all staff members were more skilled than the patron in using the catalog;

e) The incidence of failure was directly related to the size of the catalog;

f) The patron usually consulted only one subject heading during a particular subject search;

g) Joint author entries were apparently used only in rare instances;

h) Subject cards under a given heading were selected by date of publication more than four times as often as by alphabetical position;

i) Known-item searches were frequently unsuccessful, probably because they involved corporate entries, collections, or serials.

Recommendations were:

a) Improving instruction in bibliographical citation in schools and colleges;

b) Warning instructors against exclusive oral citations;

c) Making more instruction in catalog use available at the catalog;

d) Training librarians in the use of a specific catalog;

e) Providing more signs and guide cards;

f) Having staff members on duty at the catalog;

g) Investigating the potential advantages of divided catalogs and divisional or departmental catalogs;

h) Giving serious attention to the syndetic structure of the catalog by the use of "see also" cards and the provision of lists of subject headings;

i) Eliminating certain types of joint entries (to be determined by subsequent studies);

j) Giving consideration to the chronological filing of subject cards;

k) Encouraging the use of distinctive title entries;

l) Providing more analytics;

m) Supplementing the catalog with indexes and bibliographies.

Post-ALA and Beginnings of the Computer-Oriented Survey.

For a few years after the publication of the massive ALA effort, there was something of a lull in catalog use surveys.

In 1963, the Reference Services Division of the Library of Congress established a Catalog Use Committee to consider card catalog use, especially as it related to reference service. A pilot study, reported by Perrine (47) was conducted in 1965 to determine the most frequent catalog use difficulties observed by reference librarians. Forms for recording data were sent to reference librarians at twelve university libraries; eleven responded, returning more than 300 completed forms. The responses made it clear that a great deal of the reference librarian's time was devoted to assisting users with the catalog.

The most common difficulties found, in order of number of times reported, were:

a) Subject headings

b) Filing arrangement

c) Lack of see and see also references

d) Lake of title added entries

e) Lack of bibliographical information

f) Lack of analytics

g) Lack of personal name added entry

h) Lack of any entry

i) Lack of series added entry

Among other difficulties mentioned were: blind entry, inconsistent entry, incorrect call number, card missing from catalog, publication withdrawn, lack of contents of series, lack of location information, and various problems involving divided catalogs.

Probable causes of the difficulties were ranked as:

a) Local policy

b) Local cataloging

c) LC cataloging

d) Clerical error

e) Arrearages

The two most frequently mentioned catalog use difficulties, those concerned with subject headings and filing arrangements, were also the two categories where the probable cause was found least determinable.

The RSD Catalog Use Committee conducted its main study in 1967, also reported by Perrine (46). This time eleven public libraries were included with the twelve university libraries. The same methodology was used, resulting in 647 completed forms. The six most common difficulties were ranked. For the university libraries, the order of the first five remained the same as in the previous survey. The sixth difficulty, ranked second in public libraries, was the call number; this was scarcely mentioned by the university libraries. Filing difficulties led the list at public libraries, and continued to run a close second to subject headings at university libraries. The public libraries, less hesistant in assigning causes, considered problems with filing to be overwhelmingly due to the user's confusion, lack of familiarity with the catalog, etc. But Perrine declared the underlying cause to be the librarians' failure to make filing rules clear to the user.

At both public and university libraries, lack of title added entry was blamed on Library of Congress cataloging policy to a greater extent than was any other problem.

Perrine felt that the studies had not produced a precise diagnosis of the cause of the troubles, but that they had emphasized the "curative role" played by reference librarians.

Beginning in the mid-sixties, and concurrent with the Perrine surveys, the idea that the computer might provide the answers to the perennial problems of the catalog was becoming increasingly intriguing. There was a resurgence of information-gathering activity about catalog users, motivated by the hope of making use of this information for computerization.

In 1964 Dubester (20) published an article on the studies of the catalog which were made at the Library of Congress to determine the feasibility of automation of the information system in a large research library. Two studies were reported, one relating to machine memory, the other to answer the question: "Can there be the sophisticated interaction between a human user and the machine memory to permit the type of dialogue which is ever present in the process of using the bibliographic apparatus of a large research library?" This second study, very limited in scope, involved following the preliminary cataloger in the work of searching, to establish how many searches and how much time was required. The figures reported were not compared with any other type of search. The author admitted that the results "must be interpreted more as indications than as reliable facts," and declared that more studies in greater depth must be made.

Also in 1964, Brooks and Kilgour (9) made a study to obtain specific data on the heaviest use of the subject cards in the Yale Medical Library catalog. The data was intended to serve in the design of catalog computerization projects at the medical libraries of Columbia, Harvard, and Yale. In 501 interviews at the dictionary catalog, half with the public, half with staff, they found only 12.8 percent subject searches; if the public only were considered, 17.9 percent. The purposes of a significant number of these subject searches were determined to be: to locate known items; to serve as quick guides to the shelves; or to find a particular form of material, such as a journal Most known-item searches used the author approach. The conclusion was made that the relatively slight use of the subject catalog showed that the traditional card catalog does not have adequate references to meet new demands. There was an average of 1.6 subject cards per book. Another finding was that materials selected were mainly in English and of recent date.

The user survey made at the International Labour Office in Geneva in 1965, reported by Kenney (28) is an example of a well thought out attempt to achieve a complete picture of the user's library needs and practices, and to arrive at a solution in terms of catalog design. The survey found that the existing catalog was not satisfying all the demands that might be made on it, to a great extent because it was not sufficiently accessible to a large number of people who needed to use it. Reorganization of the old catalog, it was felt, would not have solved this problem, nor the problem of integrating into it pamphlets and offprints which had been cataloged by subject. Cataloging for the existing system was abandoned, and a new catalog begun, consisting of cards comprising conventional bibliographical descriptions and a summary in terms of about 1,000 words established for International Labour Review as descriptors, the cards filed by descriptors, chronologically under each heading. Indexes by subject, author, title, geographical region, report number, and conference were provided. Publications covered included monographs, a selection of articles, and documents of international organizations. The value of this system has still to be tested, and the author thought that another user survey might provide very different results.

A survey conducted in 1968 by the Aldermaston Mechanised Cataloguing and Ordering System at the Atomic Weapons Research Establishment at Aldermaston, England, was reported by Ayres and others (4). A comparison was made of the accuracy of the author and title information brought to the catalog by the user. A sample of 450 requests received by telephone, mail, and personal interview showed that title information was completely accurate for more than 90 percent of the sample, while author information was completely accurate for less than 75 percent. Of incorrect titles, 2.9 were traceable, 6.7 untraceable. Of incorrect authors, 14 percent were traceable while 11.3 were not. No claim was made for the universality of the findings, and the authors questioned their own technique of measuring, but they considered the results a probable pattern for scientific and technological libraries at least. The authors suggested extending the base of the survey in two ways: by experiments with certain types of files, such as order files, in individual libraries, and by a national survey covering a wide range of libraries.

In 1970, the results of three large-scale surveys at large libraries in the United States were published, all motivated by the possibilities of computerization.

University of Michigan Survey, 1967

The main objective of this study, reported by Palmer in 1970 (44), was to determine if patrons would be able to use successfully a shortened five-term "computer catalog entry. The conclusion was that such an entry, containing title, author, call-number, subject heading, and date, the data determined to be most used, would not reduce the users' success rate.

To obtain this information, Palmer sought to ascertain who used the catalog, why, and how well. A questionnaire was used, filled out by more than 4,400 users of the General Library catalog.

The answers tended to confirm the findings of previous surveys. Students were the largest group of users, with graduate students accounting for approximately 53 percent of use, even though they represented only 26 percent of the total student body. Undergraduate use was very high, even though the University has a separate undergraduate library.

The relationship between approach and educational level indicated in many previous studies was substantiated. Approximately 70 percent of searches were known-item. By educational level, the percentages were: 64 percent undergraduates, 73 percent graduates, 79 percent faculty. Of known-item searches, 85 percent were successful. The use of foreign language material also rose with educational level: 11 percent undergraduate, 20 percent graduate; 39 percent faculty.

The chief purpose for using the catalog was to complete class assignments. The most used elements of the catalog entry were title, author, call number, subject heading, and date, with the first three the most heavily used. Other elements were used about one-sixth of the time, with the exception of contents notes, which, although infrequently provided, were used by almost one-quarter of those questioned.

The study concurred in the finding that subject approach is used less for older and foreign language materials. The author quoted Merritt's statement that by omitting subject headings for foreign language materials the work load of the cataloger could be reduced by 50 percent while the efficiency of the catalog would be reduced only 6.2 percent (39).

Elrod (22) considers the Palmer study to be the most statistically reliable user survey made to date.

University of Michigan Survey 1968-69.

The purpose of the second survey undertaken at this university, and reported in several studies by Tagliacozzo, Kochen, and Rosenburg published in 1970 (54,55,56) was to investigate 'that aspect of information-seeking behavior which has to do with searching through a directory." (55) It was stated that "other forms of directory, such as a subject index, a telephone book, a guide, an encyclopedia, could as well have served the purpose. The ultimate goals of the survey were to improve the information systems of the present, and lay the foundations for the automatic systems of the future.

Patterns of behavior of the users of the card catalogs of four libraries were studied--the General, Undergraduate, and Medical Libraries of the University of Michigan, and the Ann Arbor Public Library. A total of 2,681 interviews were taken with a randomly selected sample, the technique being open-ended oral interviews in combination with observation of the users' behavior at the catalog.

At the Public, Undergraduate, and Graduate Libraries, known-item searches constituted 49.5 percent, 68 percent, and 71.7 percent, respectively. At the Medical Library, where the largest number of users were graduate students and faculty, 65.5 percent of the searches were known item and 32.4 percent subject.

In regard to approach to known items, 85.2 percent of users preferred the author approach, even though 70 percent had perfect or nearly perfect information on the title, while only 41.9 percent had perfect information on the author. The investigators speculated as to whether the reasons for the author preference were early training, habit, previous disappointing experiences, the user's mistrust of his knowledge of filing rules, or simple ignorance. They reached the conclusion that there should be a larger role for titles in present and future catalogs.

There was a far higher correlation between author search success and precise knowledge of the author's name than between title search success and correct knowledge of the title. A small minority used the subject approach as the first attempt to locate a known item.

User perseverance was very low; more than half the users gave up if they did not find the desired item on the first try. Second tries were almost equally divided among author, title, and subject. Third tries, when they were made, showed a sharp increase in subject approach to a known item.

Frequency of catalog use had doubtful validity as an indicator of proficiency at the catalog.

Judging the success of a known-item search was more difficult than it might seem, since the users' true objectives were not known. Success is known-item searches was given as 81 percent in General Library, and dropped to 60.5 percent in the Public Library. After correction by taking into account materials not in the library, search failure rates dropped from 39.5 percent in the Public Library to 7.2 percent, and from 19 percent in the General Library to 13.7 percent.

Evaluation of success of subject searches is far more difficult, requiring the establishment of degrees of agreement between subject headings and the searchers' terminology. Matching ranged from 96 percent in the General Library to 89 percent in the Public Library. Once terms were selected, the failure rates were 19.1 percent for the Medical Library, 19.1 in the Undergraduate Library, 15.7 percent in the General Library, and 14.4 percent in the Public Library. But more than half the people who were making subject searches in all libraries met with disappointment somewhere along the way.

Yale University Library Survey, 1968-69.

A study of users of the card catalog at the Sterling Memorial Library was conducted over a period of more than a year, and reported by Lipetz in 1970 (33). The immediate purpose was to study possible modification of subject cataloging; the ultimate purpose was the collection of data for eventual

BEST COPY

computerization. An important and unusual feature of the study was its inclusion of a report on total catalog use over a period of a year - 320,000. Many complaints have been voiced at the lack of such information, and assertions made of the necessity for knowing the total volume of use that is being talked about before valid conclusions can be reached. Of related importance was the finding of a close correlation between circulation figures and catalog use. If this correlation should be corroborated by future studies, a useful tool will be made available to surveyors of library use.

A selected sample of 2,134 catalog users was studied by preliminary interview, observation at the catalog, and follow-up interview. The major categories of users were graduate students (the largest group in the student body) 35.5 percent, undergraduates 31.9 percent, "outsiders" 20 percent, and faculty-staff (not including library staff) 12.1 percent. In proportion to their numbers in the University population, upper classmen made the heaviest use of the catalog.

Known-item searches predominated with 73 percent, followed by 16 percent subject searches, 6 percent "author" searches (in the sense of a search for the complete works of a particular author, institution, etc.) and 5 percent bibliographic. However, interviews revealed that the known-item search was frequently a concealed subject search. After analysis of users' objectives, the figures change to 56 percent known-item searches and 33 percent subject searches. Of known-item searches, the success or failure of 98 percent was determined at the catalog, but in 40 percent of subject searches and 30 percent of "author" searches the user was obliged to go to other sources to supplement the catalog search.

The author approach dominated in known-item searches, accounting for 62 percent, with 28.5 percent by title, a 4.5 percent by subject, and 5 percent by editor, series, or some other access point. Of known-item searches, 84 percent were successful. With correction for the fact that the library lacked the material in question, the figure becomes 93 percent. The success rate for subjects was judged to be about the same! Freshmen had the same success rate as other academic levels.

User information about titles was found to be slightly more accurate than about authors. Information on publication dates was highly inaccurate, 50 percent of users either having no information or turning out to be more than five years off.

Among Lipetz's conclusions were:

a) Expansion of the library's collections and better orientation of catalog users would do more to improve success in catalog use than modification or expansion of catalog entries;

b) Usability would be improved by chronological filing of subject cards;

c) Neither the author nor the title approach has an overwhelming advantage;

d) "Simplistic" cataloging by computer would be unsatisfactory;

e) More access should be provided by more "title-like" entries.

He found previous catalog surveys inconclusive and unsatisfactory, and was greatly impressed with the superiority of the human mind over the computer in its ability to correlate and interpret misleading or incomplete clues.

UNIVERSITY OF CHICAGO 1966-72.

"Requirement Studies for Future Catalogs" is the overall title of a series of studies conducted by the University of Chicago Graduate Library School over a period of seven years--the most extensive experimental survey of library catalog users ever undertaken. Its findings have been reported in a number of published articles, Master's theses, and unpublished papers. Final results were summarized by Swanson in 1972 (53).

According to Swanson, the common goal of the studies can be expressed as a question: "What information should be recorded in future library catalogs, and how should it be organized, presented, and searched in order to be best adapted to the needs of those who seek library materials?" The primary concern is "the development of a goal for catalog design and ... the fuller identification of the purposes which the catalog should serve. The needs of those who do not use the catalog should be ascertained. It is assumed that the needs of those who do use present catalogs are conditioned by their experiences, and might be changed.

The studies were limited to the search for known items; a number of justifications were adduced for the failure to deal with subject access.

Among the works produced by this project are: a survey of card catalog use studies from 1949-64 (41); a questionnaire and interview survey of what information the catalog user brings to the catalog (6); an article on the potential usefulness of catalog access points by non-standard book characteristics (16); an analysis of the problem of congestion at catalogs (7); and a timing study of the manual searching of catalogs (3).

The major effort of the project was the "Book Memory Experiment," published as Progress Report No. 2 (15). This is actually a series of experiments to determine "what people remember about a book they have once seen that might be helpful in retrieving a book from the library at some later date." The intent was not so much to help people retrieve partially remembered books, but to find a set of types of characteristics that people recall about a book that might be useful for multiple coordinate searching in automatic systems. An elaborately contrived experiment set a group of people to examining lists of books on psychology, selecting titles, finding the books, looking at them, and being examined on what they remembered about them a few weeks later.

Cooper was able to give a "memorability ranking" to twenty-four "non-standard" characteristics of books, such as number of pages, color of binding, whether it has an index, contains case histories, etc. This kind of information, useless in a standard catalog, has possibilities for an automated system, where, properly exploited, it might conceivably achieve a 500:1 search length reduction.

The memory data collected was considered a basis for catalog improvement on the assumption that there exists a "hidden market" for the use of a research library catalog, and that a large number of people do not use the catalog because their search clues are inadequate for the access points of the existing catalog. "Future catalogs should incorporate principles of redundancy and multiple-access routes to a much greater extent than they do presently.' (53) Title access is particularly important; it should be provided by each separate word of the title, with "suitable provisions for entry by means of singular/plural and other types of word form variation, as well as synonyms." A remedy for the confusion potential" of corporate entries is to provide multiple points of access to each entry.

Because these additional access points would greatly increase the size of the catalog, a main-entry catalog with a number of special purpose indexes is advocated as a reasonable solution.

C. METHODOLOGY OF CATALOG USE SURVEYS

The methodology of catalog use surveys has been criticized since the first effort in the field, not infrequently within the surveys themselves. Ayres criticized her own reliance on the questionnaire, deciding that the interview method would have been better. She did not, however, take note of the weakness of her basic assumptions: (a) "that the student in the liberal-arts college should use the card catalogue;" (b) "that the librarian knows which students use the card catalogue "more or less frequently;" (c) "that the students, selected by the librarian, would check . . . a list . . .carefully;" (d) that students know and remember what items on the catalogue card they are in the habit of using;" (e) "that students know offhand what information they would like to have on the catalogue card, which is not usually given."

The Jackson report of the ALA survey admitted that the sample, although large, was not scientifically selected. Dubester qualified his findings by mentioning the limited scope of his survey and the smallness of the sample. Perrine mentioned the lack of uniformity of practice among the libraries included in his survey, and the subjective factors involved in answering the questionnaire. Ayres questioned the standard of measurement used for accuracy of authors' names.

A number of publications deal wholly or in large part with the subject of methodology: Tauber (57), Line (32), Wood (58), Maltby, 1971 (36), Chervenic (14).

The early surveys are criticized for their unscientific sampling techniques, their lack of psychological sophistication in the formulation of questions, their lack of objectivity, their lack of comparability with other surveys, and the vagueness of their goals. The most frequent criticism is that the surveys are purely quantitative, relying on statistical tabulations and taking no account of the quality of use and its relation to the purposes of the catalog. There is no agreement on what constitutes a "typical" catalog user, nor on what "success" in the use of the catalog means. Almost every survey or theoretical study sharply questions the validity of most other surveys. The statement that no surveys have discovered anything of value is not infrequently found.

Line declared that "too often the result of a survey is an indigestible mass of badly interpreted data collected from a poorly chosen, inadequate sample by unreliable and invalid methods according to an ill-conceived design."

Wood outlined the various methods of carrying out use studies and the pitfalls to avoid. He laid particular emphasis on the importance of carrying out pilot studies before beginning the full-scale investigation. This is particularly true in the case of studies conducted by questionnaire.

Chervenic stated that evaluating a catalog from the point of view of the user should determine: (a) "if it can be used effectively, easily, and rapidly with a minimum of staff assistance;" (b) "how much instruction and/or assistance the user needs," (c) "if the documents retrieved . . . are appropriate for the user's needs . ." (d) "how many relevant documents were undetected.' Basic problems of methodology involve the reliability of users' memories, the alteration of behavior in subjects under observation, and the validity of the environments created in experimental studies.

Other problems related to the users' behavior in surveys are pointed out by Maltby (36). The user has not usually reasoned out his catalog needs; he does not know what information the catalog can feasibly supply, and he has a tendency to respond affirmatively as to the usefulness of certain catalog items, on the theory that he might find such items useful some day, or that others must find them useful.

In 1973, Seymour and Schofield (49) reported on a survey design to measure reader failure at the catalog. The design was devised by the Library Management Research Unit of the University of Cambridge, and was tested in four libraries. It proposed to determine the rate and cause of failure of known-item searches, and what action readers proposed to take to obtain items not found in the catalog. The method was twofold: to place "Catalogue Query Slips" at the catalog, on which the reader could report his failure, and to conduct brief interviews with a small sample of users at the catalog. The authors concluded that this was a simple system for conveying valuable information to the librarian on reader behavior and needs, and for indicating gaps in the library's collections. Among the results reported was that the biggest problem for undergraduates was surnames, while the research students had more trouble with titles. At Cambridge, the action planned by the largest number of users who failed to find an item was to forget it. A poor second choice was to try another library; a third, to ask a librarian.

In spite of the negative reactions to many library surveys and survey techniques, there is general agreement that more basic research is needed. Krikelas declares that 'the identification of the problems of measuring catalog use is, in itself, sufficient justification for having done the catalog use studies.' (29)

Subgroup C found a wide variety of methodology used in the surveys it selected for study. Seven were experimental, setting up artificial situations to test certain aspects of catalog use (3,5,15,16,21,30,53). Of the quantitative surveys, seven used a combination of questionnaires and interviews (2,11,12 19, 33, 37, 48); eight used interviews only (6, 9, 31, 38, 40, 43, 45, 50): three, questionnaires only (1, 35, 51); three, analysis of reference questions (4, 46, 47); one (reported in three articles) a combination of interviews with observation of user behavior (54, 55, 56); and one each, a combination of questionnaires, interviews, and analysis of reference questions (28), a combination of query slips at the catalog and interviews (49) and a tally of sources of call-slip information (39).

Twenty-one of the quantitative surveys were limited to actual users of the catalog, while four included both users and non-users.

YALE UNIVERSITY

SELECTED PORTIONS OF:

Grant No. SA OEG-1-71071140-4427

USER REQUIREMENTS IN IDENTIFYING DESIRED WORKS IN A LARGE LIBRARY

Ben-Ami Lipetz

Yale University Library
New Haven, Connecticut

June 1970

The research reported herein was performed pursuant to a grant from the Office of Education, U.S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

Office of Education
Bureau of Research

Contents

Acknowledgments iv

Summary

Objectives and Methods 1
Results 2

Introduction 9

Methods

Environment 12
Traffic Measurements 14
Interview Schedule 16
Interview Method 17
Catalog Card Follow-up 20
Book "Front Matter" Follow-up 21
Miscellaneous Measurements 21
Data Reduction 22

Results

Publications, Papers 25
Traffic 28
Catalog Users 40
Catalog Searches 43
Search Success and Potential for Improvement 50
Search Clues, Catalog Access, Catalog Data 55

Discussion 69

References 72

Appendixes

A. "User clues in initiating searches in a large library catalog," pp. 137-139 in *American Society for Information Science, Proceedings*, Vol. 5, Annual Meeting, October 20-24, 1968, Columbus, Ohio.

B. "A quantitative study of catalog use," 8 pp. Paper presented at Clinic on Library Applications of Data Processing, University of Illinois Graduate School of Library Science, Urbana, Illinois, April 27-30, 1969.

C. "Performance of Kilgour's truncation algorithm when applied to bibliographic retrieval from a library catalog," pp. 125-7 in *American Society for Information Science, Proceedings*, Vol. 6, Annual Meeting, October 1-4, 1969, San Francisco.

D. "Performance of Ruecking's word-compression method when applied to machine retrieval from a library catalog," Journal of Library Automation, Vol. 2, No. 4, 266-271 (1969 December.)

E. Forms Used for Interviewing and Follow Up

F. Factors Compared in Covariance Analysis

Abstract

Summary

Objectives and Methods

A study was conducted of the utilization of the card catalog in the main library (Sterling Memorial Library) of Yale University. The study was motivated by interest in both short-term and long-term improvement in catalog performance.

The pattern of traffic flow in the catalog area was determined by means of frequent traffic counts that were continued for more than a year. Observed traffic was used as the basis for designing an interview schedule that would encompass a thoroughly representative sample of catalog users. More than two thousand catalog users were interviewed during a full calendar year. Users were approached and interviewed at the moment of initiating a catalog search. Interview techniques were designed to bring out many details of search objectives and starting clues with a minimum of probing by the interviewer. Information on the user's academic status and experience was collected also. Refusal of interviews was less than 1 percent.

After completion of their catalog searches, users were again approached and queried regarding the results. Call numbers of identified documents were recorded. Catalog cards for these documents and front matter from these documents were copied and compared with the users' starting clues.

A number of miscellaneous studies were made, including an investigation of the causes of failure in unsuccessful catalog searches.

This study produced very voluminous records. Much of the analysis of results accomplished to date was facilitated by the use of computer programs for covariance analysis. There is ample opportunity for further analysis of available data.

Results

The findings of this study are listed below. Observations regarding gross traffic patterns in the catalog were an essential part of the study and, logically, should precede observations on the content of catalog searches; however, they provide few real surprises and are therefore listed last.

1. At the instant of approach to the catalog, 73 percent of the users are attempting a search for a particular document (known item); 16 percent are attempting a subject search; 6 percent are attempting an author search (to find out what documents are on hand from a known author, publisher's series, or other source); and 5 percent are attempting a bibliographic search (to use the information provided by the catalog card for some document without any intention of locating or borrowing the document).

2. Many users attempt document searches only as a means of locating some subject information probably contained by the documents. In terms of underlying objectives, only 56 percent of the searches are for the document as an end in itself; 33 percent are subject searches (16 percent directly by subject and 17 percent indirectly by a known document).

3. No significant variations in search objectives were detected with respect to time of year or type of catalog user.

4. Objects of attempted document searches were 80 percent monographs and 20 percent periodical articles.

5. Twenty-six percent of the catalog users are already familiar with desired documents. Probability of previous contact with a document tends to increase with years of library use by the individual involved.

6. The success or failure of a catalog search is determined right at the catalog in all bibliographic searches and in 98 percent of the document searches. In 40 percent of the subject searches and 30 percent of the author searches, the catalog user must go elsewhere (e.g., to the stack to look through possibly pertinent books identified at the catalog) in order to determine the success or failure of the catalog search. In general, 91 percent of catalog searches are evaluated at the catalog.

7. Eighty-four percent of document searches succeeded in locating the desired item and its call number. The success rate for author and subject searches appears to be the same or nearly the same.

8. No evidence of frustration or diminishing catalog use was found among catalog users in their first year of experience with the Yale libraries. Success rates appear to be about the same for all types of users.

9. The principal approaches by which users attempt to enter the catalog for document searches are: author, 62 percent; title, 28.5 percent;

subject, 4.5 percent; and editor, [illegible] percent. Inexperienced users sometimes search by author or title of an analytic [illegible] [illegible]

10. Users in their first and second years of experience at Yale altogether account for 55 percent of catalog use. Each of these two year groups has a different, somewhat atypical, distribution of approaches to the catalog which is not evident from the third year onward.

11. Of the 16 document searches that failed out of every 100 attempted, 10 failed simply because the documents were not in the catalog (one-fifth of these were added to the catalog between the time of the original search and the time of the follow-up study a few months later); 5 were in the catalog and could have been located by the user with his starting clues; 1 could not be traced because of inadequate user clues. Thus, the potential for improvement of catalog service through expansion (especially timely expansion) of the collection and through better orientation of catalog users is far greater than the potential for improvement through expansion of catalog accessibility.

12. There is no general agreement among catalog users regarding a best approach to improvement of the catalog; rather, there is diffuse interest in all possible approaches to improvement.

13. Title information and author information predominate over other types of search clues with respect to both availability and accuracy.

14. The availability and accuracy of search clues tend generally to favor the title approach over the author approach. But the difference in usefulness between the two approaches does not appear to be large.

Circumstances of catalog selectivity under particular entry terms can heavily favor the author approach for some searches and the title approach for others.

15. Among the accurate or possibly accurate clues known by catalog users that are not accessible under present cataloging practices, title-like clues (subtitles, short titles, analytic titles, etc.) are more common than author-like clues (editors, compilers, etc.).

16. Catalog users were usually able to identify desired documents in their searches despite incomplete or misspelled starting clues. Neither of two computer retrieval algorithms tested on data from this study could approximate human performance in overcoming inadequacies of search clues.

17. The use of combinations of computerized approaches shows more promise for effective retrieval than any single approach. However, devices will be required to suppress false drops, and this will probably necessitate retention of a variety of data elements in the computer store, even for simple document searches. Publication date is a prime choice for inclusion in such a store. Subject clues can also be of great value in document searches.

18. Subject searches in a catalog frequently identify far more potentially useful documents than a user can profitably examine. Non-subject data on the catalog cards can help the user to select the most promising documents and to reject the least promising. Virtually every type of data element provided on a card can help to narrow the selection, but relative usefulness of the different elements varies with users and with individual searches. Filing by publication date within a subject

heading would probably be of more general value than the current practice of filing by main entry.

19. Transcription of descriptive data from the title pages and other front matter of documents without creative human input could conceivably build a catalog that is adequate for document searches, but it would lack important conveniences of conventional catalogs.

20. Transcription of subject information from titles, contents, indexes, etc., of documents without human intervention could not possibly lead to a catalog suitable for subject searching unless a device was somehow incorporated for detecting and retrieving synonyms. Files built up by such transcription might tend to be excessively large and to be diluted with trivia not easily distinguished from the major subjects covered by the cataloged documents.

21. As expected, catalog use follows a consistent year-to-year traffic pattern.

22. Intensity of catalog use is twice as heavy during the academic year as during the summer period, but there are no distinct seasonal variations within these two periods. Holidays and recesses during the academic year are characterized by spikes of lower-than-normal catalog use followed by higher-than-normal use.

23. Catalog use and book borrowing parallel each other in an almost constant ratio from week to week. Measurement of catalog use can serve as a predictor of borrowing, or vice versa.

24. Patterns of variation of catalog use by day of the week, hour of the day, and fraction of the hour have been detected and described.

Knowledge of these patterns can be applied in planning physical facilities and in scheduling reference assistance at the catalog.

25. There is a strong tendency for catalog use to occur immediately after a user's entrance to the library, as one might expect.

26. Users of the catalog appear to be divided into two different but roughly equal populations on the basis of their length of stay at the catalog. The distribution patterns of the two groups exhibit modes of about 2 minutes and about 6 or 7 minutes, respectively.

27. Catalog users respond readily to interviews regarding their intended catalog searches. Refusal rates in this type of study are almost negligible.

28. As a group, graduate students are the heaviest users of the catalog, followed closely by undergraduates. Total faculty use is light by comparison. One fifth of the total catalog use comes from persons not directly associated with the university.

29. Per capita use of the catalog is somewhat higher for upperclassmen than it is for graduate students. Per capita use by freshmen and by faculty are equal and are at a level about half that of upperclassmen. (This does not take into account faculty use of departmental libraries.)

30. Catalog use throughout the year is relatively constant for faculty. Use by graduate students declines in the summer to half the academic year level; use by undergraduates drops to about one sixth during the summer. Use by visitors doubles during the summer.

The interpretation of these results can vary greatly, depending on whether a librarian is more interested in expanding service or in conserving money and labor. Some of the apparent implications for expansion and for retrenchment are discussed. Improved user orientation is a particularly attractive approach to improved catalog service.

Methods

Environment

The catalog whose utilization was investigated in this study was the public catalog in the Sterling Memorial Library of Yale University. The total library collection of Yale University includes more than 5 million volumes and is divided into some sixty or so units housed in various buildings throughout the campus. Sterling Memorial Library functions as the main library for Yale University, and it houses the largest portion of the total Yale collection--approximately 3.5 million volumes. The largest of the other library units at Yale (none of them housing as much as a half-million volumes) are: divinity, law, medicine, science, rare books, art and architecture, and music. The public catalog at Sterling Memorial Library provides access to all of the holdings in the total Yale collection. It contains full sets of catalog cards for books shelved at Sterling Memorial Library; and it contains only main-entry cards for books shelved elsewhere at Yale.

Physically, the public catalog of Sterling Memorial Library is located near the front entrance of the building, in a rectangular area approximately 60 feet by 40 feet, immediately to the side of the principal thoroughfare leading to the circulation desk, stack, main reading room, reference area, periodical reading room, special collections, offices, etc. Four aisles of the catalog open from the long side of the catalog area onto this thoroughfare. A fifth aisle opens from the short side onto a spur corridor which leads from this thoroughfare only to the main reading room.

The only significant portions of Sterling Memorial Library which may be reached from the main entrance without passing by the public catalog are the undergraduate reserve-book room, a browsing room, and some lavatory facilities. However, there is a second entrance to the building which is normally open on weekdays until 6 P.M. and which is used a good deal: from this alternate entrance, it is possible to reach all portions of the building except those just mentioned without passing by the catalog. Thus, it was not safe to assume that a visitor to the building who has a problem that might warrant a catalog search will actually use the catalog, as a matter of convenience, before going elsewhere in the building. Neither was it safe to assume that the catalog users who enter the catalog through a particular aisle are representative of the users who enter through the other four aisles that are available, since users coming from the front entrance might tend to favor one aisle, users coming from the main reading room might tend to favor a different aisle, etc., and each group could conceivably have significant differences in their requirements.

The catalog is housed in cabinets that are 14 drawers high. Subject entries and name and title entries are all interfiled in a single alphabetic sequence. Subject headings are based on the Library of Congress arrangement, differing in only minor respects. Contents of the cards are very similar, in data elements and arrangement, to contents of Library of Congress catalog cards; indeed, a large fraction of the cards in the catalog are modified prints of Library of Congress cards. The catalog is estimated to contain approximately 8 million cards. These were housed in about 6,000 card drawers at the beginning of the study; about half-way through the data-gathering period, the catalog was expanded into 7,000 drawers by adding a bank of cabinets in the center of the rectangular catalog area.

It should be noted that Sterling Memorial Library is an open-stack library. Yale students, faculty, staff, and many outside users holding authorization cards, all have the privilege of entering the stack to browse and to remove books for borrowing. A page service is available to all users during normal working hours. It requires the prior filling out of a loan form, including the call number of the desired item. This service is heavily patronized by many users who do not wish to enter the stack; it is the only option available to the non-Yale visitor who lacks stack privileges and wishes to consult a book housed in the stack.

Traffic Measurements

The determination of the pattern of people entering the catalog area was a key factor in the later design of an interviewing schedule which would yield a clearly representative sample of catalog users. The pattern of entry to the catalog was determined by having observers assigned to count the number of people entering the catalog area through different entryways during different times of day and days of the week. Observers were stationed where they could observe simultaneously either the front three aisles into the catalog or the rear two aisles into the catalog. For a period of five minutes duration, they would count the number of persons entering each of the aisles being observed. Timing periods were rigidly predetermined to cover different hours of the day, different days of the week, and even different tenths of each hour. Observation assignments were rigidly scheduled; the schedule repeated every seven weeks. Observations were continued over a total of 62 weeks so as to provide a 10 week overlap period for determination of any annual variation in traffic which might occur. (During this 62 week period, there was a 5-week interruption in observations, during the late summer, while shifting of catalog drawers was going on; the abnormal shifting activity tended to interfere with traffic flow.)

The total amount of time during which traffic was counted was somewhat over 4 percent of the time that the library was open during the total time span involved. For practical reasons, the coverage was more intense during weekday working hours (6 percent) and lower during evening hours and weekends (about 2.5 percent). However, observed traffic was also lower (by about one-fourth) during evening hours and weekends. Tallies of traffic counts by hour, day, and entryway for the first 10 weeks of observation were used as the basis for designing the interviewing schedule. Traffic counts were continued during the interviewing period to check on the continuing validity of the pattern observed during those first 10 weeks and to provide a rational basis for weighting of interview results if the interview schedule should prove to be biased with respect to observed traffic.

Several other traffic measurements were made in addition to the counts of persons entering the catalog area: At precise preassigned times, observers would follow anyone entering the catalog to observe where he went (which catalog drawer), how long he stayed at the catalog, and how many call-number notations he wrote down. Intervals for conducting these observations were scheduled in exactly the same pattern as intervals for gross traffic counts, so as to cover all times of catalog availability.

Observers of catalog traffic were instructed to avoid counting those library staff members who regularly work in the catalog area (filers, verifiers, reference librarians). The intent of the measurements was to count, as far as possible, only the "consumers" of the catalog service,

Table 1

Traffic in Catalog, Weekly

	First	Library	Open	Hours		Cat. Users	Users
Week	Day	Day	Eve	Wkend	Total	(by Extrap.)	Per Hour
1	671127	42.5	33.75	18.0	94.25	9,867	104.59
2	671204	42.5	33.75	18.0	94.25	10,028	106.10
3	671211	42.5	33.75	3.25	79.5	6,923	87.08
4	671218	41.25			41.25	3,028	73.41
5	671225	33.0			33.0	3,491	105.79
6	680101	33.75	20.25	18.0	72.0	7,719	107.21
7	0108	42.5	33.75	18.0	94.25	8,727	92.45
8	0115	42.5	33.75	18.0	94.25	7,979	84.58
9	0122	42.5	33.75	18.0	94.25	8,112	85.99
10	0129	42.5	33.75	18.0	94.25	9,410	99.75
11	0205	42.5	33.75	18.0	94.25	9,908	105.02
12	0212	42.5	33.75	18.0	94.25	9,096	105.96
13	0219	42.5	33.75	18.0	94.25	9,312	98.71
14	0226	42.5	33.75	18.0	94.25	8,461	89.69
15	0304	42.5	33.75	18.0	94.25	9,636	102.14
16	0311	42.5	33.75	3.25	79.5	7,618	95.82
17	0318	41.25			41.25	4,563	110.61
18	0325	41.25			41.25	4,705	114.06
19	0401	42.5	33.75	18.0	94.25	9,249	98.04
20	0408	34.0	27.0	18.0	79.0	6,352	80.41
21	0415	42.5	33.75	18.0	94.25	10,049	106.52
22	0422	42.5	33.75	18.0	94.25	9,637	102.15
23	0429	42.5	33.75	18.0	94.25	9,056	95.99
24	0506	42.5	33.75	18.0	94.25	9,500	100.70
25	0513	42.5	33.75	18.0	94.25	8,159	86.49
26	0520	42.5	33.75	18.0	94.25	7,288	77.25
27	0527	42.5	33.75	18.0	94.25	5,728	60.72
28	0603	42.5	33.75	18.0	94.25	4,660	49.40
29	0601	42.5	33.75	18.0	94.25	4,051	42.94
30	0617	42.5	33.75	18.0	94.25	2,408	25.52
31	0624	42.5	33.75	18.0	94.25	4,660	49.40
32	0701	34.0	19.0	13.0	69.0	2,772	40.17
33	0708	42.5	33.75	18.0	94.25	4,375	46.38
34	0715	42.5	33.75	18.0	94.25	2,841	30.11
35	0722	42.5	33.75	18.0	94.25	4,134	44.35
36	680729	42.5	33.75	18.0	94.25	3,302	35.00
37	0805	42.5	33.75	18.0	94.25	3,600	38.16
38	0812	42.5	33.75	18.0	94.25	2,660	28.20
39	0819	42.5	33.75	18.0	94.25	2,853	30.24
40	0826	42.5	33.75	18.0	94.25	(3,599)	38.15

Week	First Day	Library Day	Open Eve	Hours Wkend	Total	Cat. Users (by Extrap.)	Users Per Hour
41	0902	34.	19.	13.0	66.0	(2,998)	42.39
42	0909	42.5	33.75	18.0	94.25	(3,599)	38.15
43	0916	42.5	27.75	18.0	88.25	(8,496)	95.14
44	0923	42.5	33.75	18.0	94.25	(9,074)	96.18
45	0930	42.5	33.75	18.0	94.25	9,260	98.16
46	1007	42.5	33.75	18.0	94.25	9,948	105.49
47	1014	42.5	33.75	18.0	94.25	8,336	88.36
48	1021	42.5	33.75	18.0	94.25	9,772	103.58
49	1028	42.5	33.75	18.0	94.25	9,678	102.59
50	1104	42.5	33.75	18.0	94.25	9,961	105.69
51	1111	42.5	33.75	18.0	94.25	10,179	107.90
52	1118	42.5	33.75	18.0	94.25	9,586	101.61
53	1125	33.5	13.5	9.75	56.75	5,916	104.25
54	1202	42.5	33.75	18.0	94.25	12,627	133.85
55	1209	42.5	33.75	18.0	94.25	11,012	116.63
56	1216	42.5	33.75	3.25	79.5	9,091	114.34
57	1223	33.0			33.0	2,772	132.00
58	1230	33.0			33.0	3,218	97.52
59	690106	42.5	33.75	18.0	94.25	12,215	129.38
60	0113	42.5	33.75	18.0	94.25	9,167	97.17
61	0120	42.5	33.75	18.0	94.25	8,450	89.57
62	0127	42.5	33.75	18.0	94.25	8,219	87.12
Totals		2561.5	1814.0	945.5	5321.0	444,035	
1-53	total	2198.0	1577.75	834.25	4610.0	367,264	79.67
	average				86.98	6,930	
10-62	total	2198.5	1591.25	834.25	4624.0	378,166	81.78
	average				87.25	7,135	
1-9	total	363.0	222.75	111.25	677.0	65,869	97.30
	average				75.22	7,319	
54-62	total	363.5	236.25	111.25	711.0	76,771	107.80
	average				79.0	8,530	

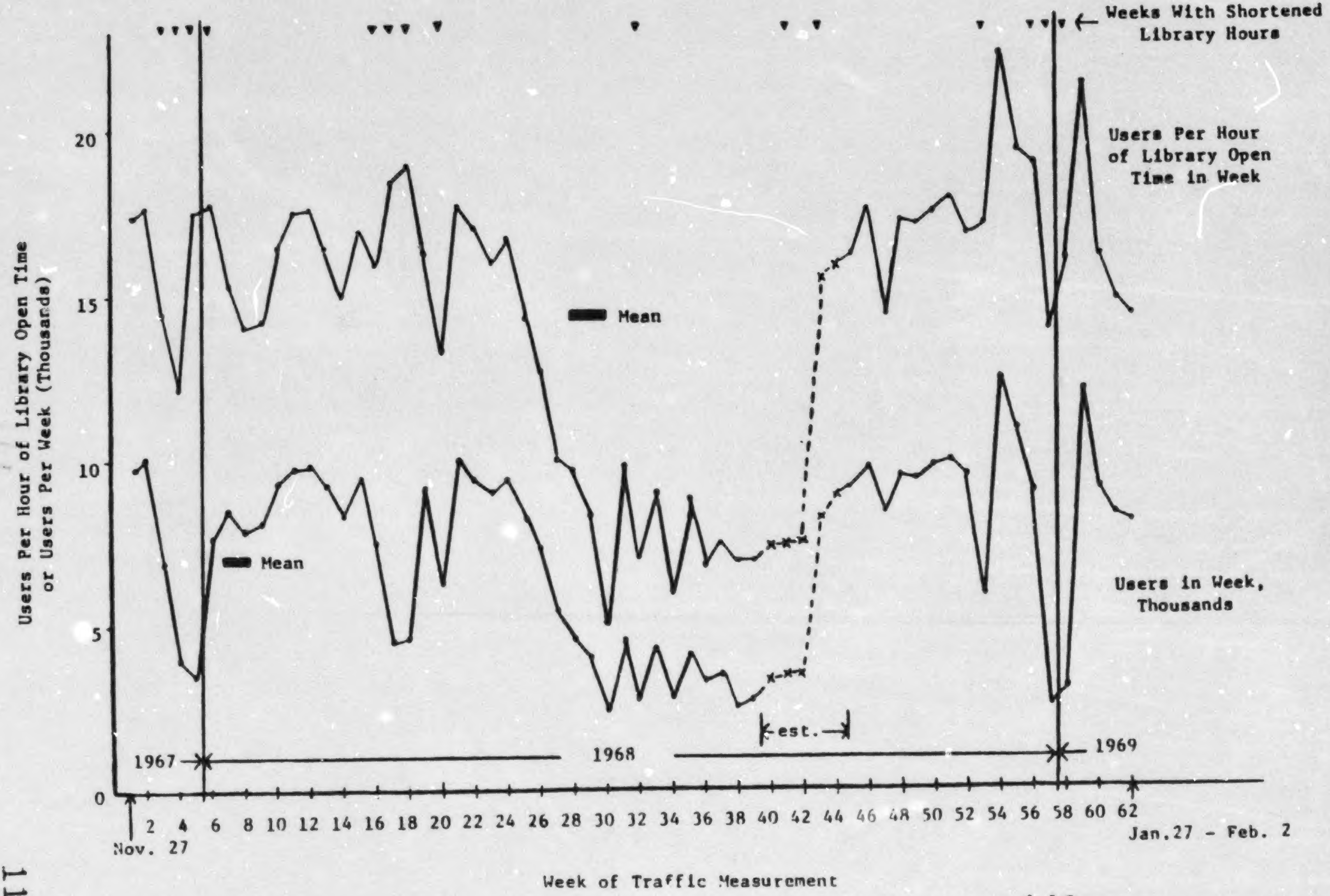
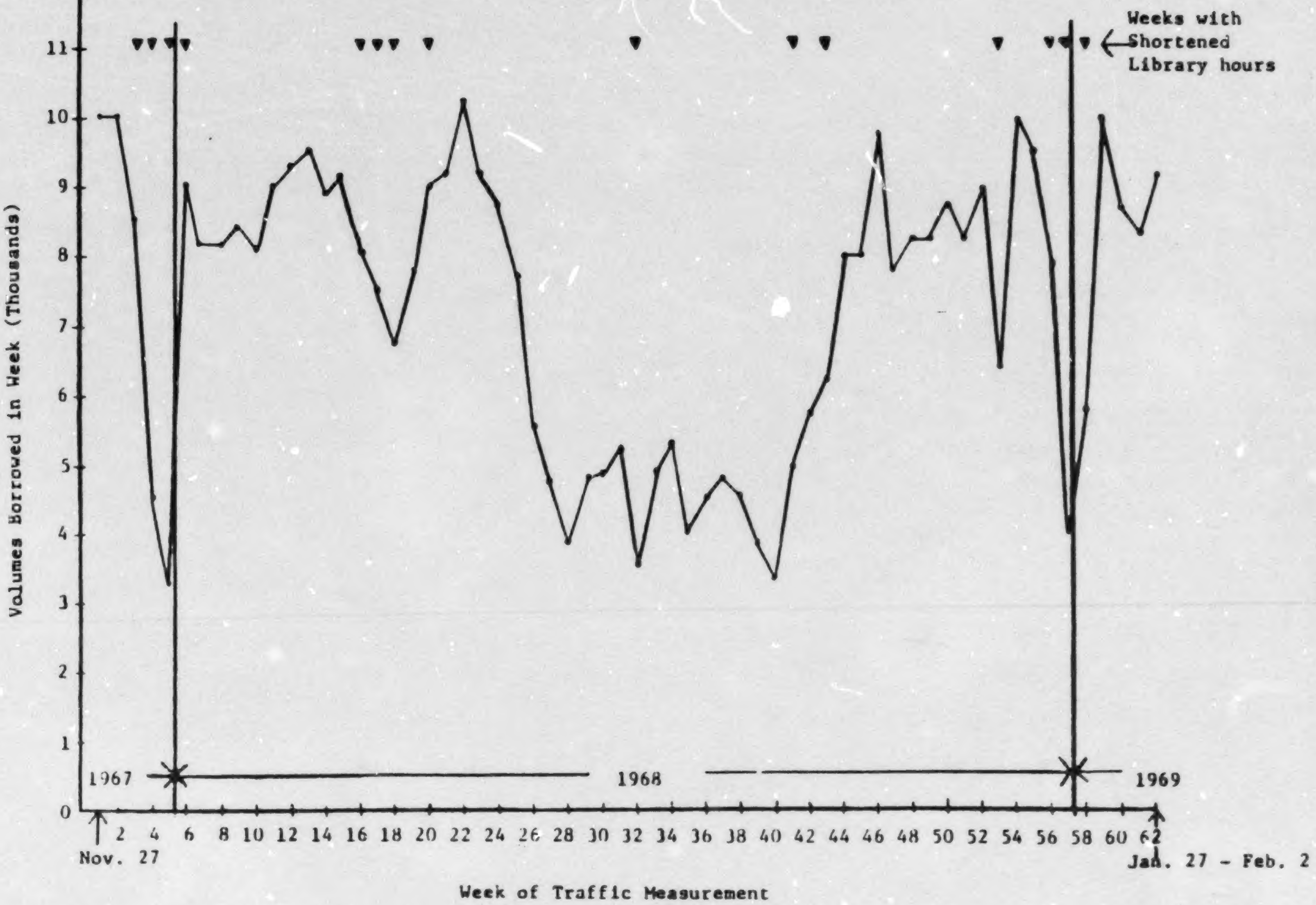


Figure 1. Weekly Catalog Traffic: Use Rate and Users

Figure 2. Weekly Borrowing Traffic



References

1. Sidney L. Jackson, *Catalog Use Study*, Director's report, American Library Association Resources and Technical Services Division, Cataloging and Classification Section, Policy and Research Committee, Chicago: American Library Association, 1958, 86 pp. Edited by Vaclav Mostecky.

2. Mary F. Blackburn, University of Chicago Graduate Library School, private communication, 1967.

3. Renata Tagliacozzo, Lawrence Rosenberg, and Manfred Kochen, *Access and Recognition: From User's Data to Catalog Entries*, Communication No. 257, Ann Arbor, Michigan: University of Michigan, Mental Health Research Institute, October 1969, 40 pp.

4. Ben-Ami Lipetz and Peter Stangl, "User clues in initiating searches in a large library catalog," pp. 137-139 in *American Society for Information Science, Proceedings*, Vol. 5. Annual Meeting, October 10-24, 1968, Columbus, Ohio.

5. Ben-Ami Lipetz, "A quantitative study of catalog use," paper presented at Clinic on Library Application of Data Processing, University of Illinois Graduate School of Library Science, Urbana, Illinois, April 27-30, 1969. In press.

6. Peter Stangl, Ben-Ami Lipetz, and Kathryn F. Taylor, "Performance of Kilgour's truncation algorithm when applied to bibliographic retrieval from a library catalog," pp. 125-127 in *American Society for Information Science, Proceedings*, Vol. 6, Annual Meeting. October 1-4, 1969, San Francisco.

7. Ben-Ami Lipetz, Peter Stangl, Kathryn F. Taylor, "Performance of Ruecking's work-compression method when applied to machine retrieval from a library catalog," *Journal of Library Automation*, Vol. 2, No. 4, pp. 266-271 (1969 December).

8. B. C. Vickery, "Bibliographic description, arrangement, and retrieval," *Journal of Documentation*, Vol. 24, No. 1, pp. 1-15 (1968 March).

9. Ann T. Curran and Henriette D. Avram, *The Identification of Data Elements in Bibliographic Records*, Final report of the Special Project on Data Elements for the Subcommittee on Machine Input Records (SC-2) of the Sectional Committee on Library Work and Documentation (Z-39) of the United States of America Standards Institute, May 1967, 117 pp. (sections paged separately).

10. F. H. Ayres, Janice German, N. Loukes, and R. H. Searle, "Author versus title: a comparative survey of the accuracy of the information which the user brings to the library catalogue," *Journal of Documentation*, Vol. 24, No. 4, pp. 266-272 (1968 December).

11. Frederick G. Kilgour, "Retrieval of single entries from a computerized catalog file," pp. 133-136 in *American Society for Information Science, Proceedings*, Vol. 5, Annual Meeting, October 20-24, 1968, Columbus, Ohio.

12. Frederick H. Ruecking, Jr., "Bibliographic retrieval from bibliographic input; the hypothesis and construction of a test," *Journal of Library Automation*, Vol. 1, No. 4, pp. 227-238 (1968 December).

13. Jacob Blanck, *The Title-Page as Bibliographical Evidence*, School of Librarianship, University of California, Berkeley, 1966, 16 pp.

A QUANTITATIVE STUDY OF CATALOG USE by Ben-Ami Lipetz

Head, Research Department, Yale University Library

Presented April 27, 1969.

Among people who are concerned with the management of libraries, it is now almost universally accepted that the traditional manual card catalog must sooner or later be replaced by an on-line computerized catalog of some sort. This is accepted almost as an article of faith; there is almost never any questioning or disputing of its inevitability. I have no intention of questioning or disputing its inevitability in this paper. But there are questions regarding the computerizing of library catalogs which ought to, and indeed do, trouble conscientious library managers. These are the crucial questions of how to computerize and when to computerize. The work I will report on was prompted mainly by concern with these questions.

The notion of computerized library catalogs has been with us for many years. Computerized library catalogs were, in fact, set up at libraries here and there as far back as a dozen or more years ago--which means during the era of the first generation of large computers. They operated in batch mode, of course, and on rather restricted document collections; but they operated. And, as the years have passed, the catalogs or indexes of more and more document collections have been committed to computers.

The appeal of computers is obvious. There is, first of all, the speed and accuracy with which they can perform basic functions, such as filing in of new data, compiling statistics, transcribing data for human reading, and transmitting data for use by other machines. There is the ability of computers to perform complex logical searches, at least on pre-designated elements of the stored data. And, very important, there is now the ability of computers to serve numerous users simultaneously at diverse locations, by means of time-shared terminals, to obviate the need for the users to be in physical attendance at the catalog storage location.

Nevertheless, the use of computerized catalogs today is still highly restricted. It tends to be confined to applications where the document collection is relatively small, where the catalog information is very simple and limited, where there is an unusually high value attached to rapid or remote catalog service, where large computing capacity is already available for purposes unrelated to the library. This is because of the negative aspects of computers: the high cost of converting existing catalogs to machine-readable form; the high cost of computers; the unavailability of really large-scale rapid-access memory; the limited reasoning capacity of existing computer programs.

Because the negative aspects of catalog computerization have been particularly serious for the very large general-purpose library, of which the Yale University Library is a prominent example, there has long been a tendency for management in these libraries to regard catalog computerization as probably inevitable but clearly remote. Therefore, it could be dismissed from serious attention. That attitude can no longer be justified. Recent events have indicated that the time when conversion will be practical for large libraries may not be so remote after all--indeed may be only a few years away. Events contributing to this change have included: the steady growth of rapid memory capacity of computers; the falling cost of computing capacity; the improvement of equipment and of programs for remote-terminal time sharing; the establishment of the MARC system to make new catalog data available in machine readable form at low cost; the development of regional library groups which have the potential to make existing catalog data available in machine readable form at low cost through cooperative effort; the development of standard machine formats which will make data interchange possible and economical.

So the decision on when to computerize the catalog of the very large libraries may soon become a matter of tactics, rather than strategy. At this point, the question of how to computerize the very large catalog is in need of urgent attention. The natural tendency, of course, would be to create a computerized catalog in the image of the existing manual card catalog, preserving all features of present-day catalog content and file organization. Tradition tends to be very strong among catalogers in large libraries. Yet tradition must be resisted, or at least questioned. Existing card catalogs are not necessarily the ultimate in human wisdom and ingenuity. Certainly some of the features in their design are attributable to the inherent limitations of cards and card drawers. There is no need to perpetuate the weaknesses of present catalogs in future catalogs. Before computerizing our catalogs, it would be very desirable for people in large libraries to take a hard look at what we would want from an ideal catalog, then see what sort of design in a computerized catalog would most closely approach that ideal. The key question is "What do we want from a library catalog?" One of our research projects at the Yale University Library is endeavoring to provide an answer to this question.

The approach we have taken is very direct. We are trying to learn what a future catalog should be by studying, quantitatively, what our library patrons are trying, successfully or otherwise, to get out of our present catalog. This study is supported, in part, by the Office of Education (1). The basic idea of a catalog use study is not at all new. There are quite a few such studies already reported in the literature, mostly master's thesis projects. Unfortunately, almost none of them inspire any confidence in the results because of gross deficiencies in experimental design, sample size, or both. Our own study was carefully designed to anticipate and obviate any foreseeable criticism. It is a two-year study which began in late 1967 and will be completed late this year.

Actually our study is much broader than I indicated in my introduction: It attempts to find out what our users want from a catalog, but it does not stop there. It also attempts to find out the extent to which our present card catalog satisfies the needs of the users. And, furthermore, it attempts to find out whether there are practical methods, manual or mechanized, to satisfy needs that are not now being met. Thus, even if we do not computerize our catalog for many years, the study should be useful in perfecting our traditional card catalog in the meanwhile.

Because the study is still in progress, I am unable to give any final results. The collection of data is more or less complete, but many of the projected analyses of the data have not yet been accomplished. Therefore, I will confine myself mainly to describing how the study has been carried out and stating what we should be able to learn from it. I will state some of our preliminary findings, but I must emphasize that all figures to be quoted here are based on incomplete data and are subject to possible revision in our final report.

The public catalog of the Yale University Library is located in the main entry hall of the Sterling Memorial Library. It contains some 7 million cards, housed in some 7000 file drawers. It is a single-alphabet catalog. It contains full catalog card sets for the more than 3 million volumes housed in Sterling Memorial Library and only main-entry cards for the 2 million volumes housed in other libraries at Yale. Since the numerous school and departmental libraries have more complete catalogs for their respective collections, users of the main catalog are generally in search of books that are housed in the collection at Sterling Memorial Library. The stacks of Sterling Memorial Library are open to all Yale faculty and students, and to a rather large number of authorized outside users of the library. The catalog, as you can imagine, takes up a rather large area, and is the scene of constant activity throughout the hundred hours a week that the library is normally open.

A catalog search is basically a word-matching procedure. The searcher seeks to match some known clue, which is commonly a word or a phrase or a name, against the headings in the file; if he succeeds in finding a file item which matches his clue, he can expect to find some associated information in the file (e.g., a call number) which is the object of his search. In a nutshell, the aims of our study are to find out: 1) what clues the catalog users possess when they begin a catalog search; 2) how well our present catalog responds to (i.e., matches) the clues that the user brings; and 3) whether the responsiveness of the catalog might be improved through some change(s) in catalog design.

We are finding out what clues the users bring to their catalog searches through interviews with a representative sample of catalog users. The interviewees are approached at the instant that they reach for a catalog drawer to begin a search; they are asked a number of carefully worked out questions designed to elicit very precisely what the searcher is trying to accomplish through the catalog and what information he has brought to the search. We also collect background information about the searchers (but we do not ask for their names). The interviewers are all trained to follow a standard interview outline. At the beginning, the questions are very general and nondirective, to avoid leading of the subject. ("Could you please tell me what you were about to do here at the catalog when I interrupted you?") Only after the subject has had ample opportunity to say whatever he wants to, in his own way, do the questions become more direct and specific. Clues available to the searcher are recorded in full detail. If he carries them in the form of a printed bibliography or as handwritten notes, they are photocopied by the interviewer. If he carries them in his mind, they are transcribed by the interviewer, taking pains to determine and preserve the searcher's personal version of the spelling of author names and unusual words.

An average interview takes about ten minutes; but it may take as little as two minutes or more than fifteen minutes, depending on the nature of the searcher's problem and the amount of information which he brings to the search. When the interview is concluded, the subject is left alone to carry out his search, but is observed discreetly from a distance. The catalog drawer which he uses is noted. When he appears to have finished, he is approached again and asked if he was successful. If so, the interviewer notes the call number(s) of the item(s) which satisfied the search. Later on, we can examine the catalog cards for these call numbers, and we can examine the books themselves, to see how well the existing catalog matched, and how well it might have matched, the clues which the user had when he began his search. This follow-up activity to examine the catalog cards and the books they represent is considerably less glamorous and exciting than face-to-face interviewing, but it is every bit as important to our study; and it actually takes more time and effort than the interviews.

The interview program, concluded only this month, was conducted over a full calendar year. We gathered data from some 2,000 interviews. The catalog users were cooperative beyond our wildest dreams. Fewer than 1 percent of the people approached refused to be interviewed--generally it was because they had to rush off to a class. Most interview subjects were delighted to be asked about their activities and eager to respond to all questions. Because of the accidents of random sampling, some people were interviewed two or three times during the year, and they still remained fully cooperative. To put it simply, the library users were very happy to learn that somebody actually cared about them.

At this point, I should explain how the interviewees were selected in order to provide a representative sample. Long before we began any interviewing, we had already begun collecting gross statistics on observed traffic in the catalog area and on various activities which occur in the catalog area. There happen to be five different entrances to our catalog area. By counting the number of people entering through each doorway at various times on different days, we constructed a preliminary projection of expected traffic by day of week and time of day. We then decided how large an interview sample we wanted (at least 1 percent). To get this, we worked out a precise interview schedule for each doorway in which the interview times and dates are in proportion to the expected traffic. Thus, each of our interviewers (2 full time, with a third available to help in emergencies) was assigned to be at a specific doorway at a specific hour and minute; and the first catalog user who entered through that doorway before a fixed interval elapsed was the person to be interviewed. Then the interviewer would go on to his or her next assignment, which would generally be at a different doorway. Assignments were spaced to allow reasonable time for completion of one interview before starting the watch for the next one. Sometimes no one would come through the doorway during the scheduled interval and so there was no interview; however, this is a random event which does not affect the value of the sampling technique.

What can affect the value of the sampling technique we used is seasonal variation in traffic pattern. Therefore, we continued the gross traffic counting program for more than a year in order to detect such variations. Differences between the observed pattern and the preliminary projection on which the interview scheduling was based will be compensated by applying appropriate weighting factors to the results of interviews conducted at different times and times of the year, so as to make the statistical results entirely representative of observed traffic.

By now you probably have a fairly clear idea of what we have been doing. Now we can discuss the ultimate question: What do we expect to get out of the study that can do anyone some good?

Let us start with our gross observations of traffic and other activities in the catalog area. We can plot traffic by time of day, day of the week, and time of the academic year, and can thus produce a clear picture of expected volume and variation of catalog use. This can be of immediate value to the library administration--particularly in planning for the provision of reference assistance, and in scheduling of catalog maintenance--and it can be important in helping to determine the peak simultaneous access capacity which must be provided in any future computerized catalog facility. Of course, librarians already know quite a lot about traffic patterns from long years of experience, so we do not expect any earth-shaking revelations from this particular result of the study.

Other aspects of our observation of catalog traffic are more novel. We have collected much information on the amount of time which users spend at the catalog. What proportion of users spends one minute per use, two minutes, five minutes, fifteen minutes, etc? From this we can tell what kind of queuing to expect in the catalog area, not only with the present level of activity but with increased future activity as our user population grows. This should give us a sort of yardstick against which to measure the performance of contemplated computerized systems, to see whether they are worthy of serious consideration. We have collected extensive data on the number of catalog cards which users actually look at in the course of a catalog search, and on the number of references which they tend to copy from the catalog cards during a search. These data may or may not prove useful in furthering our understanding of the catalog user. We have collected data on precisely which catalog drawers were consulted by searchers at times when traffic was being observed. This should tell us whether all catalog drawers tend to be consulted equally or whether there are high-activity areas and low-activity areas in the catalog. This will have an important bearing on the level of queuing to be expected in a computerized catalog for any given memory access arrangement. All of these results will be based on very simple objective observations of the catalog area--merely counting people, and timing people, counting their hand motions in writing down references or flipping cards, noting and recording catalog drawer numbers. These measurements require no interviewing at all.

The interview data will yield a wealth of potentially useful results. For one thing, they will add some useful details to our picture of catalog traffic. Since we record the academic status of persons interviewed, we will be able to describe separate traffic patterns for students, faculty, staff, outsiders--and see whether they differ significantly. We will be able to do the same for newcomers to the University (students or faculty), as opposed to old-timers. We will be able to do the same for different departmental affiliations or areas of study.

Secondly, the interview data will yield quantitative insights into what it is that catalog users are seeking, and will tell us whether different categories of users tend to bring different types of problems to the catalog. Fairly early in the study, it was observed that the objectives of catalog searches tend to fall into four rather distinct categories. One category, the "document search," is where the user has a specific published work in mind and is using the catalog in order to locate a copy of that work. A second category, imperfectly called the "author search," is where the user knows of a source of publication--usually but not necessarily an author or corporate author--and wants to find out what works are available from that source (e.g., what are some books by Thomas Mann?). A third category is the "subject search," where the user seeks to identify publications on a known abstract topic. The fourth category is the "bibliographic search," where the user has no intention of borrowing any book, but is only interested in finding the catalog card for a known publication so that he may get some specific information from the catalog card itself (e.g., to complete the bibliographic citation in a paper he is writing).

The document search is by far the most common. Analysis of a portion of our data suggests that about 75 percent of the uses of our catalog are for the purpose of locating a specific known publication (which, to our surprise, is almost always available in our collection). The other three use categories are more or less equally divided among the remaining 25 percent.

These results are preliminary, of course. Even if they were final, they would be suspect, however. There is a strong possibility or presumption that the actions of a library user are shaped by the nature of the catalog facility that is available to him. Do library users tend to accommodate themselves to what our catalog can do very well, such as locate known works? We are getting an answer to this from a very innocuous sounding but highly revealing question that we ask in our interviews. It reveals that a significant number of the document searches performed at the catalog are really subject searches in disguise. Presumably there would be a smaller proportion of overt document searches if our library catalogs were better suited for subject searching. We hope to get at the question of accommodation in yet another way, by looking for any difference in searching patterns between newcomers to the University and old-timers, or between newcomers at the beginning of the school year and later in the school year (when they have had a chance to adjust to reality).

A third, and one very important, type of result expected from our interview data will be the compilation and analysis of the search clues which catalog users possess at the start of their searches. By comparing the clues with the information available in the retrieved catalog cards and the documents they represent, we can assess the accuracy of the clues. For example, we can tell how often the catalog users start out with author names or titles that are inaccurate or misspelled, and we can analyze the frequency of different types of inaccuracies. This is fairly important for designing card catalogs, but it could be crucial for computerized catalogs. Computers make no concessions to misspelling unless designers take great pains to program around their punctilious and unyielding accuracy. The data collected from the interview program can be used to test the effectiveness of computer algorithms which are intended to produce matches despite inaccurate input from the searcher. We have already made quantitative evaluations of the effectiveness of two different data compression algorithms described in the literature by testing them on real data from our interview program.

Last, but by no means least, we will be able to use data from the interviews and from the retrieved catalog cards, and from the works corresponding to those catalog cards, to seek means to improve the quality and efficiency of cataloging rules and catalog structure. We will be able to say whether there are categories of data included on cards which are rarely wanted, or categories which are frequently wanted but rarely included. We will be able to throw some light on the wisdom of dividing a catalog into sections segregated by date of publication or by other unconventional distinctions. We should learn whether machine-like subject indexing which makes use of the key words occurring in book titles, or prefaces, or chapter headings, or indexes, etc., would match actual user clues as well as our conventional subject indexing (based on authority lists) does now. Or whether it would be even better.

Of course, we are only studying one library at one university. Will our results be useful to people outside of Yale? We believe that they will be; but I would caution in advance against blind acceptance of any of our results as universally relevant. There are bound to be local differences among libraries and universities. To find out how significant these differences can be, it would be prudent to conduct studies similar to ours at a considerable number of large libraries of different kinds. I was very gratified to learn recently that a study of this type will soon be undertaken at the Library of Congress. But more studies are needed. I hope that they will not be long in coming. After all, the computers are nearly upon us. With all the effort that has been going into research and development work on how to computerize catalogs, it would be nice to have more guidance on how to do it right.

Reference

1. Ben-Ami Lipetz and Peter Stangl, "User clues in initiating searches in a large library catalog," pp. 137-139 in American Society for Information Science, Proceedings, 5, Annual meeting, October 20-24, 1968, Columbus, Ohio, Greenwood Press, New York, 1968.

SELECTED PORTIONS OF:

SCIENCE AND TECHNOLOGY LIBRARIES
SPACE REPORT

Peter Cziffra
Elizabeth Graydon
Nancy Klath
Theresa Wiggins

Princeton University Library
Princeton, N.J.

January 1975

TABLE OF CONTENTS

		Page
	SUMMARY	ii
I.	INTRODUCTION AND METHODS	1
II.	USE OF FLOOR SPACE OF THE LIBRARIES	2
III.	STATISTICS ON GROWTH	6
IV.	LINEAR FEET OF SHELVING AND ITS USE	10
V.	MONOGRAPH USE PATTERNS AND SPACE	14
VI.	SPACE AND DUPLICATION	18
VII.	SURVEY OF UTILIZATION OF USER WORK SPACE	22
VIII.	MICROFORMS: AN EXAMINATION OF THE RELATIVE COST AND SPACE BENEFITS	25
	APPENDIX	

SUMMARY

The Science and Technology departmental libraries are growing, and the rate of growth is increasing. In 1972/73 we added nearly 16,500 volumes, and over the past seven years we have added on average 730 volumes more to the sci-tech libraries' collection than we did the previous year. As long as the production of written materials continues its escalating trend, our sci-tech rate of growth will in all likelihood continue to increase, reflecting the needs of our high-quality, research-oriented faculty and curriculum. Can the sci-tech libraries find the space to continue to shelve these new acquisitions while maintaining adequate space for users and staff?

By and large currently-assigned user and staff space seems to be reasonably adequate, although Geology, Psychology, and Plasma Physics have substandard office space. Space assigned to users and staff is not excessive, however, and reallocation of present user, staff and transit areas to collection space would not represent a significant gain of space for most of our libraries. Moreover, most of our libraries are "locked into" their present layouts by inflexible arrangements, and the cost of such reallocation would outweigh the modest benefits in collection space thus gained.

Based on the data collected in this study and applying the Metcalf standard for full utilization of shelving space - 86% of total shelving - Chemistry and Geology are already overfull, and Plasma Physics and Engineering will be overfull in the next four-five years. The remaining five of the nine sci-tech libraries seem to have space to shelve more and more acquisitions for the next 10 years, and two of the five, Population Research and Math-Physics, seem to have no foreseeable shelving problem.

The four libraries with already existing or near-capacity shelving problems will need to explore every useful way to contain growth of their collections without reducing their quality, including adoption of more restrictive holding policies, increased use of microform, reduction of duplication, and purchase of fewer uniquely-held volumes. Policies adopted to contain growth are governed by the characteristics of each library, including the rate of the collection's growth, the degree of obsolescence of the collection's subject matter, and the needs of the user population, but some alternatives available to all the sci-tech libraries were explored by the study group.

Storage of infrequently-used volumes in our high-density storage Annex Library has proven a popular method of freeing shelf space in our libraries; this alternative offers both significant, one-time, shelf space gain, as the holding policy is first applied, and a smaller gain on a continuing basis. Psychology and Engineering have an implemented holding policy that a book which has not circulated in five years is withdrawn or sent to storage in the Annex Library. Other libraries such as Geology and Chemistry use the Annex Library but without a formalized policy. Both Geology and Chemistry could free a significant amount of shelf space by formulating and implementing a comprehensive Annex policy. No library has monitored its holding policy for a long enough period of time to determine if the amount of space gained on a continuing basis is by itself adequate to accommodate the yearly acquisitions. However, preliminary statistics indicate that it is not, and it is possible that Engineering for example will need to reduce its holding policy from the current five years to three years.

This expanded use of the Annex Library assumes an additional work load for both Annex and subject library staffs in the actual transfer of volumes and maintenance of catalog records and in circulation of materials from the Annex Library to subject libraries and individual users. Our study revealed that we have not met this increased work load satisfactorily - in a significant number of cases, records have either escaped the updating process or been changed too slowly to maintain quality service.

The study showed that duplicated monographs account for about 39% of our aggregate shelf space allotted to monographs. While interdisciplinary trends and some subjects by definition require duplication, we believe that unintentional duplication exists to a significant extent. Three of the four libraries with near-term shelving problems - Chemistry, Engineering, and Plasma Physics - have rates of duplication even higher than the average and could explore ways of making the material available to their users without actually shelving the book on their premises: better intra-library lending policies; multiple records showing the location of the volume; better-defined acquisitions policies, and more cooperative decisions on a book-by-book basis.

Unfortunately the study group did not collect equivalent data for journals, but a survey of duplication showed that approximately 11% of all sci-tech journal titles are duplicated, with an average of 3.6 copies per title.

The sci-tech libraries have been slow to experiment with microforms, and no library (with the exception of the Engineering Library's AEC and NASA depository microfiche collections) has a significant part of its collection in microform. In the few experiments we have tried, the library has met with user resistance based on the frequently poor quality of the microforms and the inadequacy of available equipment. While less expensive than the equivalent book form and an efficient user of space, microform as a replacement for hard copy cannot be considered a solution to the immiment shelving problem. With technological improvements, better quality microforms, and more satisfactory equipment, microforms might be a good future solution to space problems. Until that time comes, however, maintaining the high quality of our collections may just require additional space to house these collections, when all other space-saving alternatives have been explored and implemented as fully as desirable.

The collected data pointed up two subjects the group feels require further in-depth study. We were continually plagued by the inadequacy of the data on record - data we had previously collected ourselves and presumably used in our planning. We need a more uniform approach to data collection and, even more important, a better understanding of the kinds of data useful to us on a continuing basis to help us better understand how our libraries are used in order to formulate the best policies to meet our space (and other) needs.

The 11% average of missing books for the science libraries as a whole seems to us disturbingly high, and the overall problem as well as the vast difference in rate of loss from library to library is a worthwhile subject for future study.

The Committee is aware that its study has raised more questions than it has answered. While we meant to present recommendations, in fact we have set forth alternatives and suggestions, mostly because our libraries are too disparate for a common solution. In part, too, the shortcomings of the study are a result of unavoidable and substantial changes in the membership of the Committee, which disrupted the continuity of the work.

The real value of this study is that we have assembled for the first time some useful data on how space is currently being used, and what space can be made available by implementing certain programs - so that each sci-tech librarian has the necessary data to foresee space problems and plan for their solution.

I. INTRODUCTION AND METHODS

A study was undertaken in the Science and Technology libraries of Princeton University to develop data on the space in these libraries: how much there is, how it is used, and when it will be full. An impetus for the study was the observation of the following paradox: the Science and Technology libraries, individually and as a group, are considered to have a finite size. Yet the size of any library inevitably is increased when renovations are made or a new departmental building is occupied. Further inspection of the data collected from these libraries reveals that almost all of them are growing at an increasing rate. Alternatives to regular shelving and unconstrained acquisitions have to be considered, among them massive withdrawals of duplicate bound journal runs, greater reliance on the Annex Library,[1] the use of microforms, reduction of duplicate buying of titles among the science libraries, and restrictive acquisitions policies.

Data needed for the study was developed and distributed for completion by each librarian, who provided statistics on the use of floor space and shelving and the number of persons on the staff of the library. The statistics are presented and discussed in sections II and IV. Other methods were used to obtain data on other space considerations. For example, data pertaining to collection size was obtained from each library's annual report statistics of previous years. Two staff members made a survey of usage patterns from a random sample of monographs in all of the libraries, which is discussed in section V and used as the basis of the monograph duplication study.

Beyond the considerations outlined in the Appendix, a count was taken of the number of persons in each library at various times during the academic year. The data thus obtained were compared with the number of places available to readers to determine the adequacy of reader space.

---

[1] The Annex Library is a high density storage building, located 3 miles off campus.

TABLE VII-1

* User Headcount Related to User Working Places

Library	Total no. of working places	Number of Filled Places: Post-Midterm: Avg.of 3 highest	Post-Midterm: Avg.for period	Ordinary(usual): Avg.of 3 highest	Ordinary(usual): Avg.for period	Reading Period: Avg.of 3 highest	Reading Period: Avg.for period	Avg.for all Periods: Avg.of 3 highest	Avg.for all Periods: Avg.for period
		Number(%)	Number(%)	Number(%)	Number(%)	Number(%)	Number(%)	Number(%)	Number(%)
Astronomy	28	8 (29)	7 (25)	7 (25)	6 (21)	11 (39)	8 (29)	9 (31)	7 (25)
Biology	77	17 (22)	12 (16)	26 (34)	18 (23)	22 (29)	18 (23)	22 (29)	16 (21)
Chemistry	51	16 (31)	13 (25)	18 (35)	14 (27)	20 (39)	15 (29)	18 (35)	14 (27)
Engineering	66	40 (61)	27 (41)	31 (47)	23 (35)	33 (50)	24 (36)	35 (53)	25 (38)
Geology	20	7 (35)	4 (20)	9 (45)	5 (25)	8 (40)	6 (30)	8 (40)	5 (25)
Math-Physics	120	69 (58)	39 (33)	62 (52)	39 (33)	58 (48)	44 (37)	63 (53)	41 (34)
Plasma Physics	20	3 (11)	2 (10)	3 (11)	3 (11)	4 (20)	3 (11)	3 (11)	3 (11)
Population Research	6	3 (50)	2 (33)	2 (33)	1 (17)	1 (17)	1 (17)	2 (33)	1 (17)
Psychology	40	21 (53)	16 (40)	32 (80)	21 (53)	28 (70)	20 (50)	27 (68)	19 (48)
All Libraries	428	184(43)	122 (29)	190 (44)	130 (30)	185 (43)	139 (32)	186 (43)	130 (30)

* Working places are places users choose to work: each carrel seats one; each table seats roughly half its available places.

VII. SURVEY OF UTILIZATION OF USER WORK SPACE

The study attempted to survey the utilization of work space by taking headcounts during three different weeks of the academic year: post-midterm (week of March 20, 1974); normal week (week of April 10, 1974); reading period (week of May 15, 1974). Headcounts were made at 11 a.m., 4 p.m. and 9 p.m. on the Sunday, Monday, Wednesday, and Friday of these three weeks. (Some libraries are not open during some of these times; in such cases, a "not applicable" (NA) count was recorded.)

For each of the three weekly periods an average of the three highest headcounts and an average of all headcounts (excluding NA's) were taken and related to the number of the library's work places (one place per carrel and roughly one-half the number of chairs for each table). The results of this tabulation are found in Table VII-1. The headcount included all users (except staff) in the library at that time, whether or not seated.

In both the composite picture and individual library statistics (with a few exceptions) there was no real difference in usage from week to week. Three libraries (Math-Physics, Engineering, Psychology) were used quite a bit more heavily than the others, at peak and average times both. It is interesting to note that, of the heavily used libraries, the Psychology and Engineering libraries with the largest percentage of occupied seats have the largest percentages of floor space allocated to users.

Most of the remainder of the libraries cluster into a range of peak usage of between 30 and 40% of usable spaces filled with average use of between 17 and 27%, while Plasma Physics shows extremely low use of working space.

On the basis of these figures no library (with the possible exception of Psychology during peak periods) seems to be critically in need of user space. On the other hand some libraries, notably Chemistry and Biology, might be able to exchange some unused space for shelf or staff space if the need were to arise. Astronomy, Population Research, Geology, and Plasma Physics have such a small percentage of space allocated to the user that such an exchange would not really provide a significant relief of pressure.

The figures in Table VII-1 are rudimentary. As shelving space tightens and expansion into new quarters becomes improbable, we may want to observe the users of our working areas more closely in order to make well-educated space tradeoffs: are they studying; are they using the reference collection; are they selecting a book, then leaving the premises; is the book on the shelf more important to them than the working space in the library?

CASE WESTERN RESERVE UNIVERSITY

COMPUTER SIMULATION OF THE CIRCULATION SUBSYSTEM OF A LIBRARY*

May 1975

W. M. Shaw, Jr.

University Libraries
Case Western Reserve University
Cleveland, Ohio 44106

ABSTRACT

An existing model of the circulation subsystem of a library has been modified, to explicitly include renewals and to describe a semester loan policy. An extensive amount of experimental data have been obtained by recording the history of all books which circulated during the fall semester 1973, from Sears Library at Case Western Reserve University. These data, which characterize various aspects of user behavior, in combination with an numerical statement of the loan policy of the library serve as input parameters for the model which simulates the events that occur in the circulation subsystem. The results of the simulation provide information about the availability of books and the delay associated with recalls. These results have been compared to experimental observation. The agreement between the predicted values and the experimental observation is good. Thus the validity of the model is demonstrated, and the model is used to simulate various alternative loan policies. The effect of these alternatives on book availability is given.

---

* supported by the Case Western Reserve University Libraries and the National Science Foundation, Grant No. GN36085